UHF Hand-Held Portable
Land Mobile Transceiver

# VX-520U

## Service Manual

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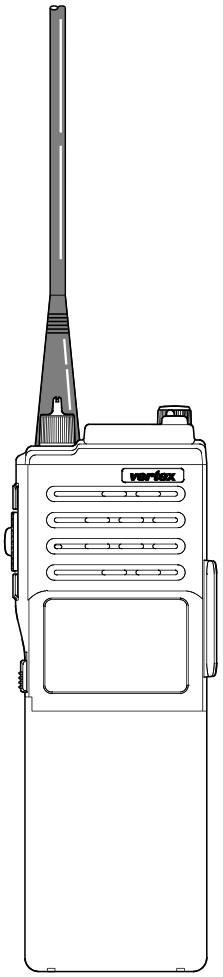


### *Introduction*

The VX-520U is a compact hand portable transceiver for the UHF land mobile band that offers the convenience of small size, light weight, and simple operation. The VX-520U can be simply programmed by your VERTEX STANDARD Dealer with up to 32 channels for single and split frequency operation. The VX-520U provides up to 5 watts of RF output power and includes a flexible quick-connect antenna.

The transceiver and Ni-Cd battery packs are constructed of thick high impact polycarbonate plastic, with special attention paid by the designers to tight sealing and ruggedness, assuring years of reliable operation even in harsh environments.

The following pages describe the operation, features and accessories of the VX-520U. With proper care and operation, the transceiver will provide many years of reliable communications.

## Contents

# *Operating Manual Reprint*

The VX-520U is a frequency-synthesized, microprocessor-controlled FM hand-held portable transceiver providing up to five watts of power output on up to 32 channels in the UHF Land Mobile Band. Designed specifically for commercial and professional applications, the VX-520U is housed in high-strength die-cast aluminum alloy, sealed to MIL-810 C, D & E intrinsically safe (I/S) and weather-tight specifications.

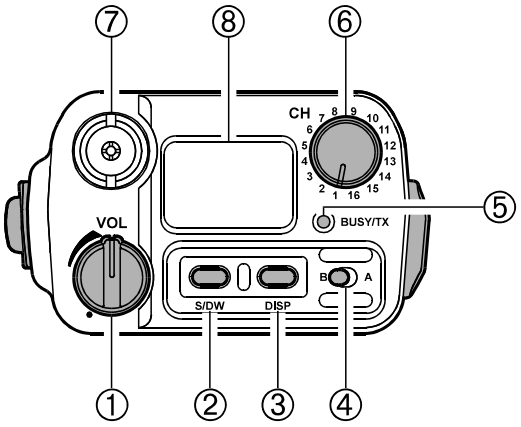
User selectable features include a four-mode display with channel name or number, upright or inverted for easy viewing when on your belt; selective channel scanning, adjustable-pause priority scanning, and variable transmitter power output.

Other user-selectable features include push-button display illumination, 2-tone decoder enable/disable (with optional F2D-5 Unit installed), and manual squelch override. The VX-520U is easily programmed by your dealer using a Vertex Standard Service Kit with an IBM PC-compatible computer.

Please read this manual carefully to become familiar with the features of the VX-520U.

## Controls & Connectors

### *Top panel*




### (1) **VOL** Control

This control adjusts the volume of the receiver, and turns the radio off when rotated fully counterclockwise to the click-stop

### (2) **S/DW** Button (Scan/Dual Watch)

Pressing and holding this button more than 2 seconds (but less than 4 seconds) turns the channel scanner on and off. Pressing and holding this button more than 4 seconds activates the Dual Watch feature (explained later).

### (3) **DISP** Button

Pressing and holding this button more than 2 seconds (but less than 4 seconds) activates functions as programmed by your dealer and determined by your system requirements (See "Pre-Programmed Functions", page 6). Pressing and holding this button more than 4 seconds inverts the LCD display to either frontward or backward facing readout (the backward display is convenient for viewing when wearing the transceiver on your belt).

### (4) **A/B** Toggle Switch

The 32 available channels in the VX-520 can be organized into 2 Groups with up to 16 channels in each. Toggle this switch to select a group "**A**" or "**B**" for operation.

### (5) **BUSY/TX** Indicator

This lamp blinks green when a signal is being received (or the squelch is opened by pressing the **MON RES** button) and red when transmitting. To avoid interference, do not transmit if the lamp is glowing green. When the battery almost depleted, this lamp blinks red, indicating that the battery needs recharging or replacement very soon.

### (6) **CH** Rotary Selector

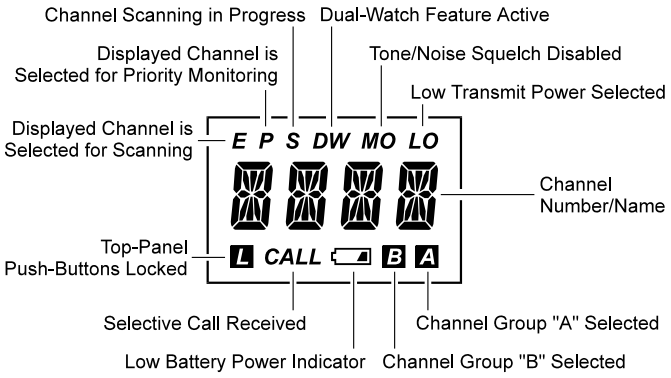
This rotary switch selects the operating channel. If a channel is selected that is not available for operation, "-- -- -- --" is displayed, accompanied by a rapid warning beeper (2 beeps/sec.).

### (7) Antenna Jack

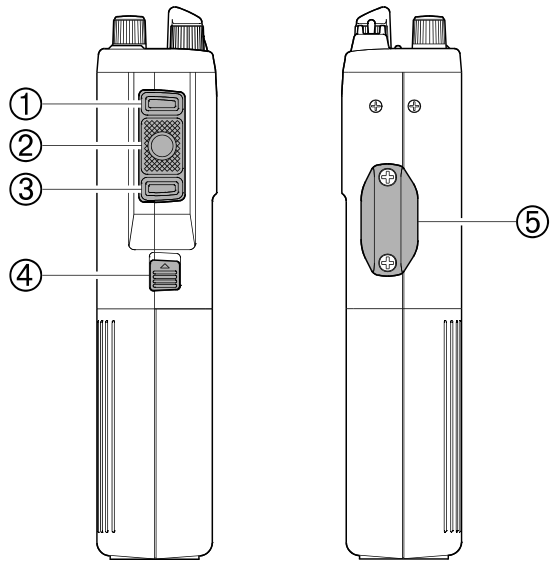
This threaded-type jack accepts the supplied flexible antenna. Any other antenna types used here must be designed for the programmed operating frequencies.

### (8) Liquid Crystal Display

In addition the channel number name, the display includes some operating status symbols, indicated in the diagram below.



### *Side Panel Buttons*




### (1) **MON RES** (Monitor/Reset) Button

Pressing and holding this button more than 2 seconds (but less than 4 seconds) disables the tone squelch, and permits monitoring of stations transmitting on the selected channel while still keeping your receiver quiet from noise ("***MO***" will appear at the top right of the LCD). Press it again to only hear calls within your network.

Pressing and holding this button more than 4 seconds toggles the tone and noise squelch override, allowing all stations (and noise) on the channel to be heard. This may be used to hear weak stations whose signals would not normally open the squelch. Do this to pre-adjust the VOLume control before receiving calls.

*(With Selective Calling Option)*

When the two-tone sequential decoder unit (F2D-5) is installed, and a selective call has been received ("***CALL***" indicator on), pressing and holding this button more than 2 seconds (but less than 4 seconds) will reset the call function on the current channel and silence the receiver, otherwise pressing and holding this button more than 4 seconds resets the call function on ALL channels.

### (2) **PTT (Push-To-Talk) button**

Hold this button to transmit (the "**BUSY/TX**" indicator glows red).

### (3) **LAMP/LOCK** button

Press this button momentarily to illuminate the display for five seconds. Pressing and holding this button locks top-panel push-buttons (**S/DW**, **DISP**, and the optional DTMF keypad); this can be enabled to prevent radio settings from being disturbed.

### (4) Battery Release button

Slide this button in the direction of the arrow (upward) for battery removal.

### (5) **EAR** and **MIC** Jacks

These jacks primarily intended for use with the optional **MH-45E2B** External Speaker/Microphone. An external earphone can be used in the larger jack, in which case the internal speaker will be disabled. When these jacks are not used, make sure the plastic cap and its two screws are in place to protect the insides of the transceiver.

## OPERATION

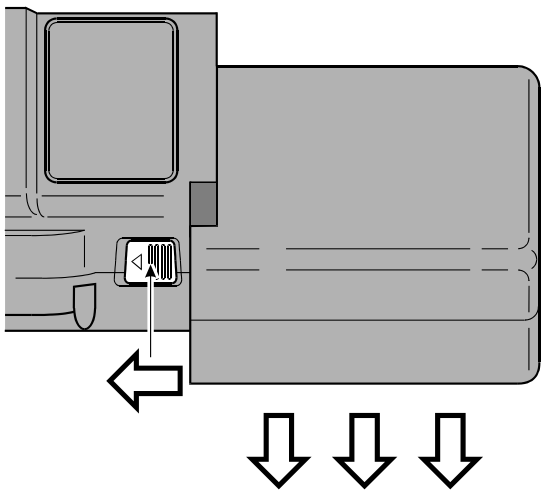
### *Preliminaries*

If the transceiver has not been used since leaving the factory, fully charge the battery using **VAC-520** Rapid Desktop Charger before using it.

Mount the battery on the transceiver as described and shown in the illustration below. Also, install the antenna on the jack on top of the transceiver by screwing the connector into the jack until it is finger-tight.

### *Battery Removal & Replacement*

- Make sure that the **VOL** control is set into the off click-stop, and remove the protective soft or hard case, if used.
- Grasp the transceiver with your left hand, so your palm is over the speaker and your thumb is on the Battery Release Button.
- Move the button in the direction indicated by the arrowhead, while using your right hand to slide the battery pack toward the side with the button. The battery pack should slide smoothly out of its track.
- To replace the Ni-Cd pack, repeat the second and third steps above, simply sliding the battery case in the other direction after aligning the shorter side of the battery pack with the track below the Battery Release Button.



# *Operating Manual Reprint*

## *Preliminary Steps*

Before operating the transceiver for the first time:

- ❒ Charge the battery pack and connect the supplied helical rubber flex antenna to the antenna jack on the top of the transceiver. *Never operate the transceiver without an antenna connected*.
- ❒ If you have a Speaker/Mic, we suggest you do not connect it until you are familiar with basic operation.
- ❒ Before proceeding, please review the "***Top & Side Panel Controls***" outline, if you have not already, to familiarize yourself with the functions of the controls.

## *Basic Operation*

- ❒ Switch on the transceiver by rotating the **VOL** control clockwise out of the click-stop (a momentary beep will sound). For now, adjust the control to about mid-position (12-o'clock), later you can adjust the level to suit the operating environment.
- ❒ Switch the **A/B** toggle switch to select the channel group "**A**" or "**B**" for operation, then rotate the **CH** knob to select a channel for operation, the LCD will show the currently selected channel. If "-- -- -- --" is displayed, along with a rapid (2 beeps/sec.) beeping tone, the selected channel position is not available for operation.
- ❒ To transmit, wait until the channel is clear ("**BUSY/TX**" LED off), then press in the **PTT** switch on the side of the transceiver while speaking across the face of the radio. A clear normal voice will provide the best quality transmission. For maximum battery life, select low power output (covered later) whenever possible. During transmission the "**BUSY/TX**" indicator glows red. Release the **PTT** switch to receive.
- ❒ To receive weak stations better, try positioning the radio as high and far away from your body as possible, or disable the squelch momentarily by holding the **MON RES** button on the side of the radio for > 4 sec. (until the second low/high beep sounds). With the squelch disabled, the "**BUSY/TX**" indicator will blinks green and channel noise and weak stations can be heard. To quiet the radio again, press the **MON RES** button again momentarily.
- ❒ When you are done operating, be certain to turn the **VOL** control to the off position to conserve battery life.

**An important note about your radio !**

Some of the radio/button functions discussed next will only operate in your radio if so programmed by your dealer, or after the installation of certain internal optional units. In this way, the radio's operation can be simplified and customized specifically for the user according to network requirements. If pressing a button on your radio does not result in the same function described in this manual, or if you are uncertain of the functions your particular radio is configured with, contact your dealer. See "**PRE-PROGRAMMED FUNCTIONS**" on page 6.

## *Scanning*

Scanning allows you to sequentially check for calls on all or only those channels you select. To start scanning, pressing annd holding the **S/DW** button more than 2 seconds (but less than 4 seconds). A beep then sounds and the display will clear and show "SCAN". Scanning will pause when a signal is received, at which time the channel number (or alphanumeric tag) will be displayed. A small "***S***" will be displayed above the channel, indicating the scanner is still active, but paused.

During this pause, you can press the **PTT** switch and talk to the station. Otherwise, scanning will resume a few seconds after the signal is no longer present. While scanning, if you momentarily press the **PTT** switch, operation automatically shifts to a default channel. This default channel can be set to the priority channel (both "***P***" and "***S/DW***" are displayed), last-busy channel, or home channel, *depending on how your radio was programmed*.

To stop scanning, simply press **S/DW** momentarily again. Operation will return to the channel that was last selected when scanning was activated.

*If enabled by dealer programming*, you may select only the channels you want to scan, and have others skipped-over by performing the following routine.

Turn the radio OFF, then depress the **S/DW** button while turning the radio back ON again. "PROG" will momentarily appear on the display, after which it will revert to the currently selected channel (this indicates you are in the programming mode). If user-access is disabled "INH" will appear briefly.

Use the **CH** knob to select a channel, then press the **S/DW** button to enable the channel for scanning ("***E***" will appear in the upper left corner of the LCD). Repeat this process for each channel you want the scanner to check.

To remove a channel from those to be scanned, press **S/DW** again, so that "***E***" no longer appears in the display.

After you have enabled all the channels you want to scan, turn the radio off, then on again to return to normal operation.

### *Priority Scanning*

Priority scanning allows you to scan and monitor channels while the receiver periodically checks for calls on a pre-selected ("priority") channel. You may want to use this feature if you want to scan different channels, but don't want to miss a call for you on a primary dispatch, emergency or tactical frequency. After a call has been received on the priority channel, operation returns to the programmed default channel scheme, as mentioned before. Only *one channel at a time* can be selected as the priority channel.

To assign the priority channel;

- Turn the radio OFF, then depress the **S/DW** button while turning the radio back ON again. "PROG" will momentarily appear on the display, after which it will revert to the currently selected channel (this indicates you are in the programming mode). If user-access is disabled "INH" will appear briefly.
- Use the **CH** knob to select a channel which you wish to assign the priority status, then press and hold in the **S/DW** button more than 1 second. A small "***P***" will now appear at the top left corner of the display whenever this channel is selected, along with an accompanying "beep".
- If you wish to change the priority status;
  1. Delete the priority status by pressing and holding the **S/DW** button more than 1 second.
  2. Rotate the **CH** knob to select the new priority channel, then assign the priority status by pressing and holding the **S/DW** button for more than 1 second.
- After you have assigned the priority channel, turn the radio off, then on again to return to normal operation.

When a priority channel has been selected, the scanner will check the priority channel regularly as you scan the other channels. If a signal appears on the priority channel, the scanner will pause and operation will jump to the priority channel. Otherwise, the scanner will pause on active non-priority signals as previously described.

If a call comes in on a non-priority channel that you need to respond to, just press the **PTT** switch while the scanner is paused on that channel. As long as no call comes in on the priority channel, you can send and receive on the other channel: scanning will resume when you finish and the channel clears.

### *Dual Watch*

If you need to operate on a non-priority channel while still checking for calls on the priority channel, the Dual Watch feature let's you to do this without using the scanner. When enabled, operation on any selected non-priority remains normal as before, however, when a signal is received on the priority channel or when you press the **PTT** switch, operation immediately shifts to the priority channel. The rate at which the Dual Watch feature samples the priority channel can be set by the user.

- To begin Dual Watch operation, first assign a priority channel as described before, then select the non-priority channel you wish to operate on.
- Press and hold the **S/DW** button until the second beep sounds, "***DW***" (but not "***S***") will appear at the top of the display.
- To manually shift to the priority channel, press the **PTT** switch. At this time you make transmit, otherwise, if no signal is received within 2 seconds, operation will revert back to the other selected Dual Watch channel.
- To turn off the Dual Watch Feature, press and hold the **S/DW** button again ("***DW***" will disappear in the display).

#### Low Battery Power Indication

When the rechargeable Ni-Cd battery pack voltage reaches a low level, the "  " indicator appears at the lower right corner of the LCD, and the "**BUSY/TX**" indicator will blinks red. *Immediately remove the Ni-Cd pack and install a freshly charged battery pack, or insert the radio into the charging stand for a complete recharge cycle*. If you plan to operate your radio for extended periods of time, you may want to keep a spare, fully-charged pack handy.

## PRE-PROGRAMMED FUNCTIONS

The function selected by pressing and holding the **DISP** button more than 2 seconds (but less than 4 seconds) can be customized by dealer programming and your network requirements. A brief explanation of available functions is provided below. However, contact your dealer for details on their use and operation.

### *Low Transmit Power*

This reduces the power output of your radio to approximately one watt to conserve battery life, and when full power is not needed to maintain reliable communications. "***LO***" will be displayed at the upper right corner when enabled.

### *Alpha Tag*

This displays an alpha-numeric channel name, usually describing the channel, rather than merely displaying a channel number. These may be programmed to assist you in recognizing channels by name, rather than by memorizing channel numbers and their assignments.

### *Talk Around*

This feature enables simplex operation on semi-duplex channels: the transmit frequency becomes the same as the receive frequency (regardless of any programmed offset for the channel).

*Note*: This feature has no effect on simplex channels.

### *Optional Accessory*

### Voice Encryption (FVP-22):

When installed, pressing and holding this button more than 2 seconds (but less than 4 seconds) will turn on the optional voice encryption unit for privacy during communications.

### ENI (Emergency Numbering Identification) Unit (FTE-19):

When installed, pressing and holding this button more than 2 seconds (but less than 4 seconds) will turn on the optional ENI Unit, then *within 1/2 second*, press this button again to transmit the ENI signal.

## BUTTON FUNCTIONS

As mentioned before, button functions can be customized by programming from your Vertex Standard dealer to meet your communications/network requirements. Some features may require the purchase and installation of optional internal accessories for operation. The table below illustrates the possible Top-panel button programming combinations. Functions are explained on the previous page "**PRE-PROGRAMMED FUNCTIONS**." For further details contact your nearest Vertex Standard dealer. For future reference, check the box next to the function that has been assigned to the button on your particular radio, and keep it handy.

| | Press and Hold (< 2 seconds) | Press and Hold (> 4 seconds) |
|---|---|---|
| **DISP Button** | ❒ HI/LOW TX Power<br>❒ Alpha Tag<br>❒ Talk Around<br>❒ Accessory (Voice Encryption)<br>❒ Accessory (ENI) | Toggles the Top Panel LCD display between normal and inverted readout |

| | Press and Hold (< 2 second) | Press and Hold (> 4 second) | Press and Hold while Power-on |
|---|---|---|---|
| **S/DW Button** | Starts/Stops Channel Scanning | Starts/Stops Dual-Watch Feature | 1) User-selectable channel scanning programming (if enabled)<br>2) Priority channel assigning (if enabled) |

## CUSTOM SETTINGS

Below is a table of radio features that can be customized by dealer programming. To change a feature as your requirements change, contact your Vertex Standard dealer. For future reference, check the box next to the option that has been programmed in your particular radio, and keep it handy.

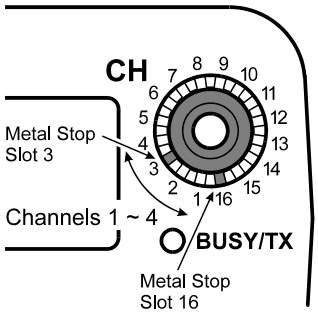
| Feature | Options | Explanation |
|---|---|---|
| Channel Scan | ❒ Enabled<br>❒ Disabled | Channel scanning can be disabled completely for systems not requiring this feature. |
| Scan-Stop Resume | ❒ 5-seconds<br>❒ Carrier | In the 5-seconds mode, scanning pauses on a busy channel for 5 seconds, then resumes.<br>In the Carrier mode, scanning pauses and remains on a busy channel until the station stops transmitting. |
| User-Scan Program | ❒ Enabled<br>❒ Disabled | If enabled, the user can program which channels are to be scanned; otherwise, dealer-programmable only. |
| Dual Watch | ❒ Enabled<br>❒ Disabled | Dual-Watch can be disabled completely for systems not requiring this feature. |
| Channel after PTT | ❒ Priority Ch.<br>❒ Home Ch.<br>❒ Last-Busy | If the **PTT** is pressed during scanning, determines which default channel the radio returns to : the selected Priority Channel, a designated "Home" Channel, or the channel that was last-busy. |
| Monitor | ❒ Enabled<br>❒ Disabled | Enable/Disable the side-panel **MON RES** button (See pages 6 & 9). |
| DISP Button | See Table | Flexible dealer-programming as outlined in the table on the previous page. |

## INSTALLING CHANNEL-STOPS

To simplify operation and prevent selection of unprogrammed/unused channels or channel groups, tiny metal inserts or "stops" can be inserted into the top panel beneath the **CH** selector knob. A tiny tab protruding from beneath the skirt of the **CH** knob engages the stop(s) as it is turned, preventing further rotation.

To insert a stop, rotate the **CH** knob to the channel "**1**" position and use the Allen wrench to ***loosen*** the setscrew locate the **CH** knob, then pull off the **CH** knob. Insert the stops firmly into the appropriate slot(s) for the desired channels, using a pair of tweezers or fine needle-nose pliers, according to the drawing below. For example, to limit **CH** selection to channels 1 - 4, insert one metal stop at the slot 16 (channel 1 *minus* "one position"), and the other at the slot 3 (channel 4 *minus* "one position"). When done, press the **CH** selector knob back on the shaft, align the indicator of the **CH** knob to channel "**1**," then tighten the setscrew.

***Note***: The use of mechanical stops should not be used or relied upon as the sole means to prevent selection or transmission on an invalid or unauthorized channel. Channels should be locked-out or TX-inhibited via programming by your Vertex Standard dealer, and stops inserted as a operating convenience to you and your network users.



# *Specifications*

## General

| | |
|---|---|
| **Number of Channels**: | 32 |
| **Frequency Range**: | 450-488 MHz |
| **Channel Spacing**: | 12.5/25 kHz |
| **Power Supply Voltage**: | 7.2 VDC |
| **Current Consmption**: | Standby (Saver On) 19 mA |
| | Standby (Saver Off) 50 mA |
| | Receive 200 mA |
| | Transmit 2/1 A |
| **Battery Life**: | 11 hrs. (13.3 hrs. w/saver) |
| **Ambient Temperature Range**: | –22° F to +140° F (–30° C to +60° C) |
| **Frequency Stability**: | ±2.5 ppm |
| **Dimensions**: | 2.3" (W) x 5.9" (H) x 1.5" (D) inch w/FNB-29A |
| | 59 (W) x 149 (H) x 39 (D) mm w/FNB-29A |
| | 2.3" (W) x 6.7" (H) x 1.5" (D) inch w/FNB-29AL |
| | 59 (W) x 171 (H) x 39 (D) mm w/FNB-29A |
| **Weight**: | 1.21 lbs (547 g) w/o ANT w/FNB-29A |
| | 1.24 lbs (564 g) w/o ANT w/FNB-29AL |

## Receive

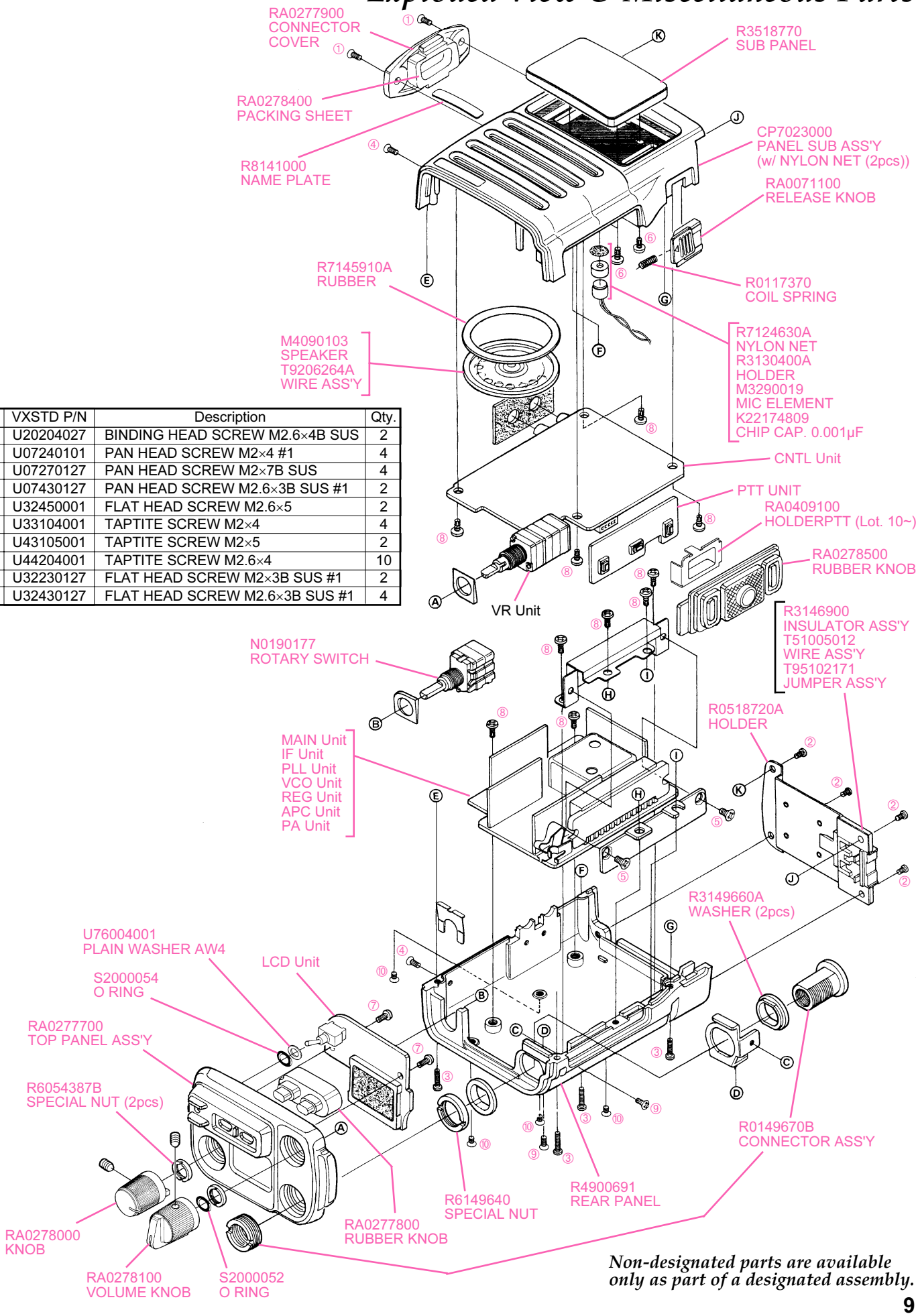
| | |
|---|---|
| **Circuit type**: | Double-conversion Sperheterodyne |
| **Sensitivity**: | 0.25 μV (EIA 12 dB SINAD) |
| | 0.35 μV (20 dB Quieting) |
| **Adjacent Channel Selectivity**: | 75 dB/65 dB |
| **Intermodulation**: | 72 dB |
| **Spurious and Image Rejection**: | 75 dB |
| **Conducted Spurious**: | –57 dBm |
| **Hum & Noise**: | 40/45 dB |
| **Audio Output**: | 0.5 W @16 Ohms, 5 % THD |

## Transmit

| | |
|---|---|
| **Power Output**: | 5.0/1.0 W |
| **Modulation**: | 11K0F3E, 16K0F3E |
| **Conducted Spurious Emmisions**: | 60 dB Below Carrier |
| **FM Hum & Noise**: | 45/50 dB |
| **Audio Distortion (@1 kHz)**: | <2.5 % |

*Specifications may be subject to change without notice or obligation.*

# *Exploded View & Miscellaneous Parts*

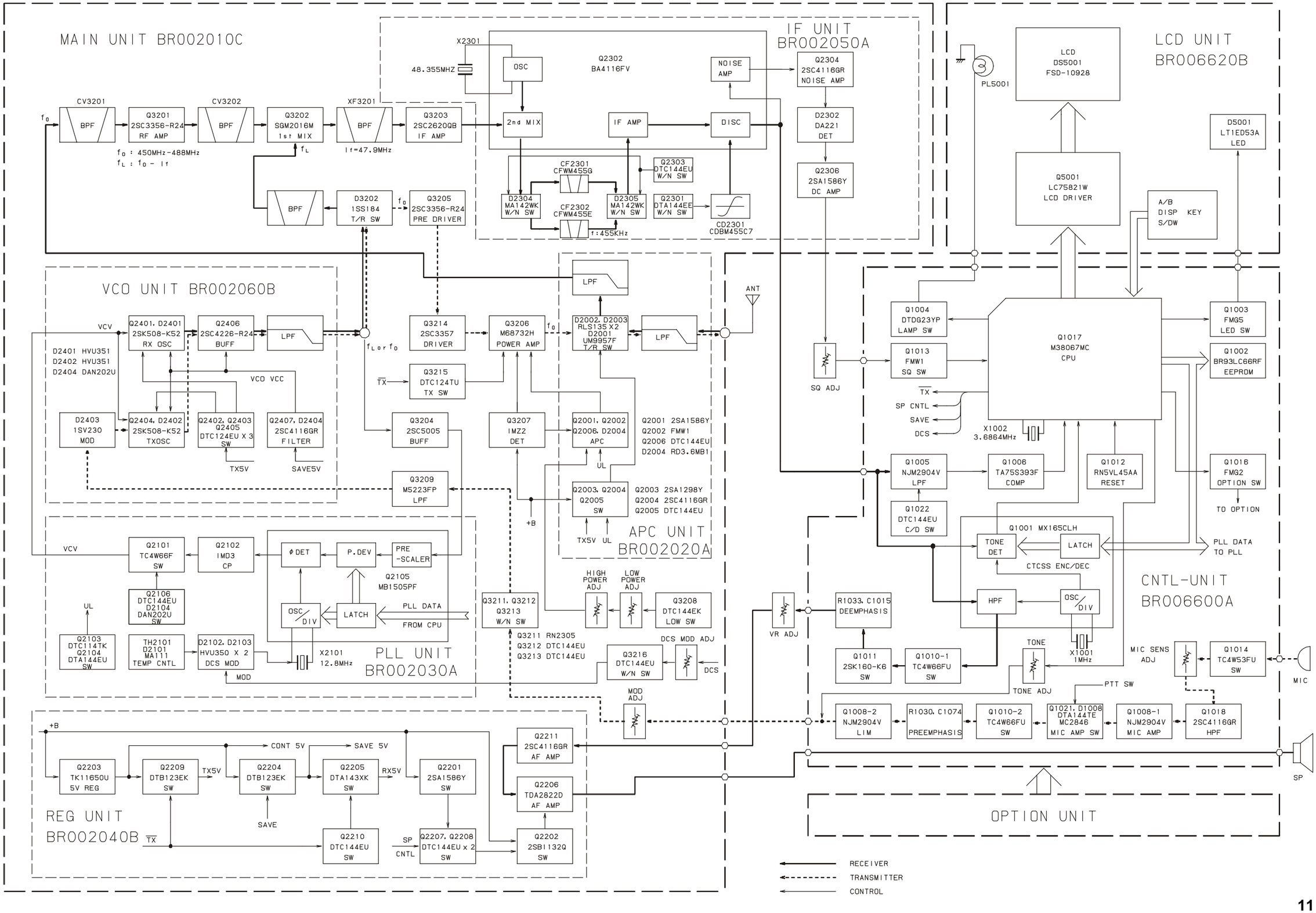



| No. | VXSTD P/N | Description | Qty. |
|---|---|---|---|
| ① | U20204027 | BINDING HEAD SCREW M2.6×4B SUS | 2 |
| ② | U07240101 | PAN HEAD SCREW M2×4 #1 | 4 |
| ③ | U07270127 | PAN HEAD SCREW M2×7B SUS | 4 |
| ④ | U07430127 | PAN HEAD SCREW M2.6×3B SUS #1 | 2 |
| ⑤ | U32450001 | FLAT HEAD SCREW M2.6×5 | 2 |
| ⑥ | U33104001 | TAPTITE SCREW M2×4 | 4 |
| ⑦ | U43105001 | TAPTITE SCREW M2×5 | 2 |
| ⑧ | U44204001 | TAPTITE SCREW M2.6×4 | 10 |
| ⑨ | U32230127 | FLAT HEAD SCREW M2×3B SUS #1 | 2 |
| ⑩ | U32430127 | FLAT HEAD SCREW M2.6×3B SUS #1 | 4 |

*Non-designated parts are available only as part of a designated assembly.*

*Note:*

# Block Diagram



## *Block Diagram*

***Note:***

Refer to the block diagram when reading this description. For finer details, refer to the schematic diagram.

## Receiver

In coming signals at the antenna are passed through a low pass filter and T/R switching diode on the ANT SW Unit before delivery to the front-end circuitry on the mother board. Here the signal is band-pass filtered again by a 2-stage resonator, amplified by Q3201 (**2SC3356-R24**), and then further filtered by a 2-stage band-pass resonator befor application first mixer FET Q3202 (**SGM2016M**) along with the first local signal from Local Amplifier Q2406 (**2SC4226-R24**) on the VCO Unit.

The 47.9 MHz product from the first mixer is delivered through 4-pole monolithic crystal filter XF3201 (± 6.0 kHz BW) to strip away all but the desired signal, which is amplified by Q3203 (**2SC2620QB**) on the Main Unit. FM receiver sub-system IC Q2302 (**BA4116FV**) on the IF Unit includes local oscillator, mixer, IF limiter amplifier and FM detector circuits. The amplified first IF signal is applied to mixer section, along with the second local signal generated via 48.355 MHz crystal X2301, which produces the 455 kHz 2nd IF when mixed with the 1st IF signal within Q2302. The 2nd IF passes through ceramic filter CF2301 (4.5 kHz BW) or CF2302 (7.5 kHz BW) to strip away unwanted mixer products, and is then applied to the limiter amp in Q2302, which remove amplitude variations in the 455 kHz IF before detection of the speech by Q2302 via quadrature resonator CD2301.

Detected audio is delivered to the CTCSS IC Q1001 (**FX165CLH**) and then passes through the de-emphasis circuitry consisting of R1033 & C1015, via muting gate Q1011 (**2SK160-K6**) and volume control to audio power amplifier Q2206 (**TDA2822D**) and Q2211 (**2SC4116GR**) on the regulator unit, providing up to 0.5 W to the external speaker jack or 16-Ω loudspeaker.

### Squelch Control

The squelch control circuit consists of noise amplifier Q2304 (**2SC4116GR**) and band-pass filter and squelch trigger within Q2302 on the IF Unit, and control circuitry within microprocessor Q1017 (**M38067MC**) on the control unit.

When no carrier is received, noise at the output of the detector in Q2302 is amplified by Q2304, and band-pass filtered by the noise amplifier section of Q2302 and then rectified by D2302 to provide a DC control voltage for the squelch switching transistor Q2306 (**2SA1586Y**). With no carrier, the emitter of Q2306 is high. The signal is buffered by Q1013. This SCAN STOP signal is delivered to the microprocessor on the Control Unit, and microprocessor controlled through Q1003 (**FMG5**) to the **BUSY** indicator on the top panel, which remains off until a carrier is received. The microprocessor causes audio mute gate Q2207 (**DTC144EU**) & Q2202 (**2SB1132Q**) to open the audio power amplifier power source, thus disabling the audio amplifier and silencing the receiver when no signal is being received, and during transmission.

When a carrier appears at the discriminator, noise is removed from the output, causing the emitter of Q2306 to go low, then Q1017 controls the signal high, which in turn causes Q1003 to turn on the **BUSY** indicator. The microprocessor then checks for CTCSS tone information from Q1001, plus Digital Code Squelch information form Q1006 (**TA75S393F**). If not transmitting and no tone squelch is programmed for the channel, or if the received tone matches that programmed for the channel, the microprocessor switches Q2207 to allow operation of the audio power amplifier.

## Transmitter

When the PTT switch is depressed, audio from the microphone is delivered to the Control Unit, where it is high-pass filtered by Q1018 (**2SC4116GR**), and by one section of microphone audio processing dual opamp IC Q1008 (**NJM2904V**). After pre-emphasis by C1074 and R1030, another section of Q1008 serves as an IDC (Instantaneous Deviation Control) amplifier to prevent over-deviation from excessive microphone levels, and the two remaining states provide low-pass filtering to suppress out-of-band modulation, and buffering.

Processed audio from the IDC Unit is delivered to VCO Unit where it is applied, along with carefully filtered DC from Q2407 (**2SC4116**), to varactor diode D2403 (**1SV230**) to modulate (via the TX Line) VCO FET Q2404 (**2SK508-K52**, on the VCO Unit), which oscillates at the transmit frequency. VCO output is buffered and amplified by Q2406 on the VCO Amplifier Unit before returning to the Main Unit. Buffered, modulated VCO output is applied via T/R switch D3202 to driver Q3205 (**2SC3356**), Q3214 (**2SC3357**), and the transmit signal is delivered to RF Power Module Q3206 (**M68732H**).

The transmit signal is passed through T/R switching diode D2001 on the APC Unit, and then low-pass filtered by L2003~2005, and C2007, C2011 to suppress spurious harmonics before application to the antenna.

Transmitter output is controlled by Q2001 (**2SA1586Y**) and Q2002 (**FMW1**) on the APC Unit. When the TX 5V line (from the regulator Unit) is active, bias voltage and driver collector voltage is applied to the RF Power Module via Q2003 and Q2004 , turning it on. A sample of the final transistor collector current in the RF Power Module is taken via R3224 on the mother board, detected by Q3207 (**IMZ2**), passed through RF Power potentiometer VR3201 on the main unit back to APC switch Q2001 (**2SA1586Y**) via one half of Q2002 (**FMW1**) on the APC Unit. Q2002 passes the Automatic Power Control voltage when enabled by the other (transmit sequencer) half of Q2002. This circuit is also used by the PLL to disable the transmitter when the PLL is unlocked, and by the microprocessor to select low power output.

# Circuit Description

## PLL

The first local signal for the receiver, and the carrier for the transmitter (at the transmitter frequency) are generated by the PLL. This circuit consists two voltage controlled oscillator (VCOs), prescalar, programmable divider, reference oscillator, phase detector, charge pump and low pass filter.

The VCO (on the VCO Unit) consists of Q2401, Q2404 and varactor diodes D2401, D2402 and D2403 (mentioned above). The oscillating frequency is controlled primarily by the level of DC voltage fed from the loop filter (low-pass filter) to the varactor diodes. The VCO output is buffered by Q2406 (**2SC4226**), and then to prescalar within Q2105 (**MB1505**) on the PLL Unit, which divides the VCO frequency by 64 or 65, according to a control signal from the prescalar control logic section of PLL IC Q2105.

The divided signal from the prescalar is fed to the programmable divider section of Q2105, where it is further divided down to 10/12.5 kHz according to data from microprocessor Q1017 on the Control Unit. Meanwhile, the reference oscillator section of Q2105 generates the reference frequency with crystal X2101, which signal is divided by Q2105.

The reference and the divided VCO signal are applied together to the phase detector section of Q2105, from which any phase difference between the two signals results in a pulse train from the phase detector. The pulses are applied to the charge pump Q2102 (**IMD3**) and then through low-pass filter R2101, R2103 ~ R2106, R2122 and C2102, C2104 ~ C2107, to produce a DC voltage at a level corresponding to the difference in phase between the reference and the divided VCO signal. This DC voltage is returned to the varactor diodes on the VCO Unit, locking the frequency of the VCO to the crystal reference oscillator.

In the Tx mode, Tx 5 volts applied to inverter Q2106 pulls analog switch Q2101-1/2 off, removing R2106 and R2122 from the PLL loop.

Also, the transmitter VCO is modulated by the filtered speech audio applied to modulating varactor diode D2403, as previously described. If Digital Coded Squelch is in operation, the DCS signal modulation is applied to the PLL reference, via varactor D2102 & D2103 (**HVU350**).

## Control Unit & Supply Buses

Microprocessor Q1017 (**M38067MC**) on the control unit contains programming in masked ROM to generate serial data to control the Liquid Crystal Display driver IC Q5001 (**LC75821E**) on the LCD Unit, and the programmable divider in the PLL according to channel frequency data stored in externally programmable EEPROM. Q1017 also includes programming for channel frequency scanning. DCS encode/decode, CTCSS IC Control, option unit control, selectable channel steps and frequency range.

The microprocessor receives an indication of the condition of the noise squelch from the FM receiver subsystem IC on the IF Unit, by which scanning is activated or deactivated.

Q1017 also controls the power saver function and transmit/receive switching by selecting the supply buses on the regulator unit:Q2209 (**DTB123EK**), Q2205 (**DTA143XK**) and Q2210 (**DTC144EU**) disables the RX 5V bus when the power saver is active.

When the PTT switch is pressed, the impedance change on the microphone line is detected by Q1015 (**2SA1586Y**) on the control unit, which signals the microprocessor that the transmitter is active. The microprocessor then activates LED indicator D5001 to glow red (TX).

Voltage comparator Q1012 (**RH5VL45AA**) controls power-up resetting of the microprocessor.

## UHF Transceiver Required Test Equipment

- ❍ IBM PC compatible computer
- ❍ Vertex Standard VPL-1 Cable, or FRB-2 Service Kit, with CE37 Channel Programming Diskette
- ❍ Vertex Standard CN-1 BNC Adapter plug
- ❍ RF Signal Generator with calibrated output level at 1 GHz
- ❍ Deviation Meter (Linear Detector)
- ❍ AC Voltmeter
- ❍ SINAD Meter
- ❍ In-Line wattmeter with 5% accuracy at 1 GHz
- ❍ Regulated DC Power Supply adjustable from 4 to 10 V, 3 A
- ❍ 50-Ω Non-reactive Dummy Load: 10 W at 1 GHz
- ❍ Frequency Counter: ±0.2 ppm accuracy at 1 GHz
- ❍ AF Signal Generator
- ❍ DC Voltmeter: high impedance

Before beginning alignment, connect the transceiver and PC using the VPL-1 Cable or FRB-2 Set as described in the EEPROM Programming chapter, and download the EEPROM data from the transceiver to the computer.

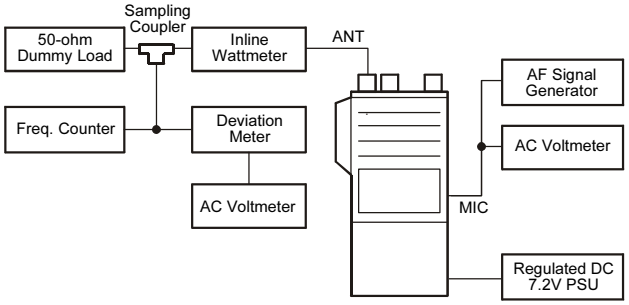
Then store this data in a disk file so that it can be up-loaded when alignment is finished.

You should find the corresponding data file on the computer disk for the transceiver version you are aligning, containing channel settings for the high edge, middle and low edge of the transceiver's frequency range in channels 1, 2 and 3, respectively. Up-load this file to the transceiver.

| LOW BAND EDGE CH. (1) | BAND CENTER CH. (2) | HIGH BAND EDGE CH. (3) |
|---|---|---|
| 450.0 MHz | 460.0 MHz | 470.0 MHz |

## PLL & Transmitter

Set up the test equipment as shown for transmitter alignment. Adjust the supply voltage to 7.2 V for all steps where not specified otherwise.



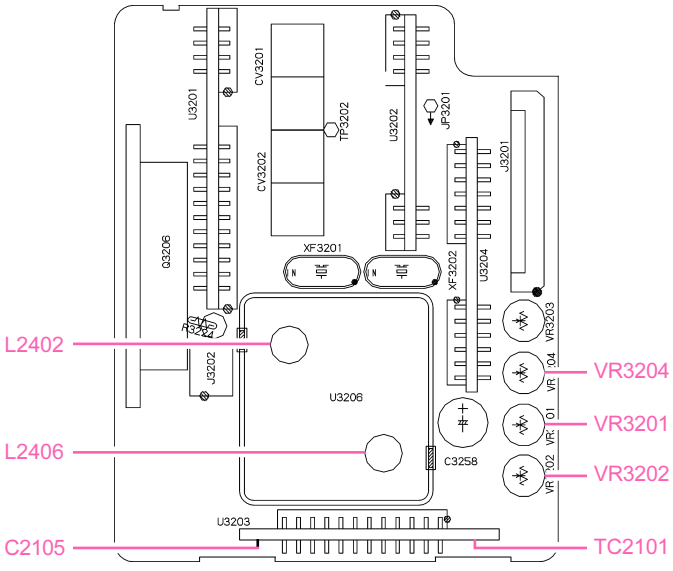

PLL & TX Alignment Setup

## PLL VCV (Varactor Control Voltage)

- ❒ Connect the DC voltmeter between **C2105** on the PLL Unit and chassis ground.
- ❒ Set the transceiver to CH 3 (high band edge), and adjust **L2402** on the VCO Unit for 3.5 V ± 0.1 V on the voltmeter.
- ❒ Transmit on the high band edge, and adjust **L2406** for 3.5 V ± 0.1 V on the voltmeter.
- ❒ Set the transceiver to CH 1 (low band edge), and confirm the low-end VCV is more than 1.3 V while transmitting, and also while receiving.

## PLL Reference Frequency

- ❒ With CH 2 (band center) selected, key the transmitter and adjust **TC2101** on the PLL Unit, if necessary, so the frequency counter displays the band center frequency ±300 Hz (for the version being aligned) when transmitting.




PLL & Transmitter Alignment Points (I)

# Alignment

## Transmitter Output Power

❒ Set the transceiver to band center CH 2, and select high power output.
❒ Ensure that the supply voltage is precisely 7.2 V, then adjust **VR3201** (while the PTT switch is pressed) for 5.0 W on the wattmeter, and confirm that supply current remains below 2.2 A.
❒ Select low power output ("**LO**" displayed on the LCD), and adjust **VR3202** on the Main Unit for 1.1 W on the wattmeter, and confirm that supply current remains below 1.2 A.

## Modulation Level

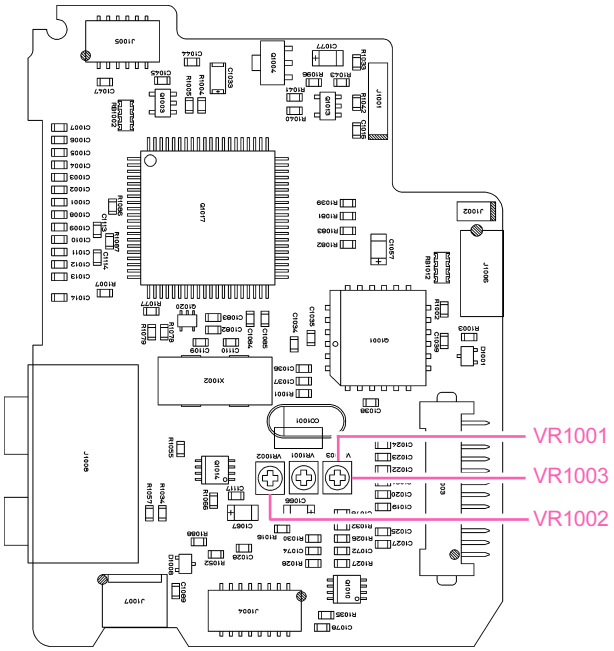
❒ With the transceiver set to band center CH 2, adjust the AF generator for 77 mVrms output at 1 kHz to the MIC jack.
❒ Press the PTT switch and adjust **VR3204** on the Main Unit for a deviation of ±4.3 kHz (for 25 kHz steps) or ± 2.1 kHz (for 12.5 kHz steps).
❒ Reduce the AF generator output to 7.7 mVrms.
❒ Press the PTT switch and adjust **VR1002** on the Control Unit for a deviation of ± 3.0 kHz (for 25 kHz steps) or ± 1.5 kHz (for 12.5 kHz steps).

## CTCSS Tone Level

❒ With the transceiver set to band center CH 2, set the CTCSS encoder on .
❒ Press the PTT switch and adjust **VR1001** on the CNTL Unit for a deviation of ±0.7 kHz (for 25 kHz steps) or ± 0.35 kHz (for 12.5 kHz steps).

## DTMF Tone Level

❒ With the transceiver set to band center CH 2.
❒ Press [**1**] key on the DTMF keypad while press and holding the PTT switch, adjust **VR1003** on the CNTL Unit for a deviation of ±2.5 kHz (for 25 kHz steps) or ± 1.25 kHz (for 12.5 kHz steps).

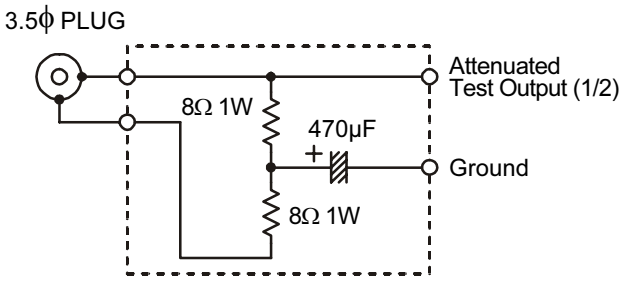



PLL & Transmitter Alignment Points (II)

### Note!

*Because of the bridge audio amplifier circuit used in the **VX-520U**, it is necessary to construct and use a simple audio load test adapter as shown in the schematic diagram above, when conducting receiver alignment steps.*

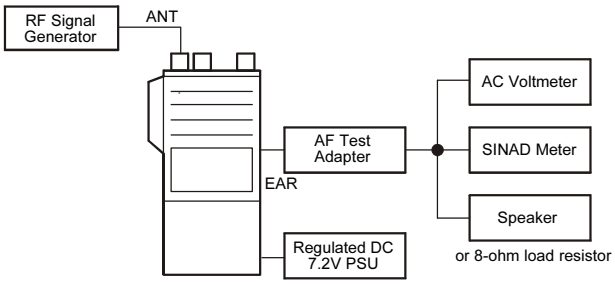
*Do not connect either side of the speaker leads to chassis "ground".*




AF Test Adapter Schematic

## Receiver

Set up the test equipment as shown for receiver alignment, and construct the audio test adapter as described in the box on previous page .




Receiver Alignment Setup

❒ With the transceiver set to band center CH 2, and the RF signal generator tuned to the same frequency, set the generator for ± 3.0 kHz deviation with 1 kHz tone modulation, and set the output level for 40 µV at the antenna jack.

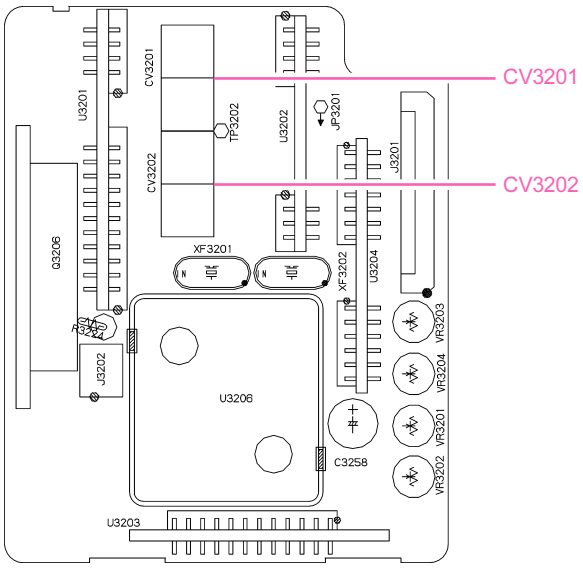
❒ Adjust **CV3201** and **CV3202** on the Main Unit for optimum SINAD, reducing the signal generator output level as necessary for proper meter deflection.

❒ After the previous step, final signal generator level should be better than –4 dBµ for 12 dB SINAD.

## Squelch Threshold

❒ Set the transceiver to CH 2, and turn off the RF signal generator output.

❒ Turn **VR4002** on the VR Unit clockwise until the squelch just closes, and then counter-clockwise very slightly so that it just opens.




Receiver Alignment Points

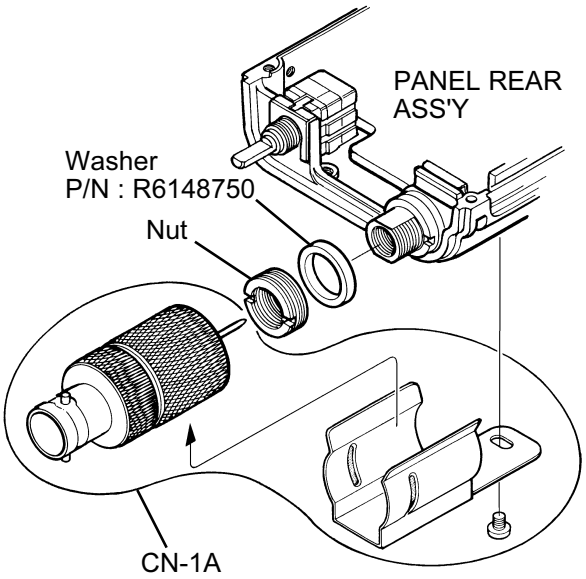
## Using the CN-1N BNC Adapter

The **VX-520U** uses a threaded-type antenna jack to match the supplied helical flex antenna. To connect the **VX-520U** to test equipment or an external coaxial-fed antenna, the **CN-1A** adapter should be used to mate the transceiver with standard BNC connector.

With the transceiver assembled, the **CN-1A** adapter can be installed by simply unscrewing the antenna, and installing the **CN-1A** in its place. When performing the alignment procedure, first disassemble the transceiver case as described, then replace the washer and threaded nut removed from antenna jack. Install the **CN-1A** adapter by carefully threading the unit on the antenna jack nut, then rotating the black knurled collar clockwise until it is finger-tight.

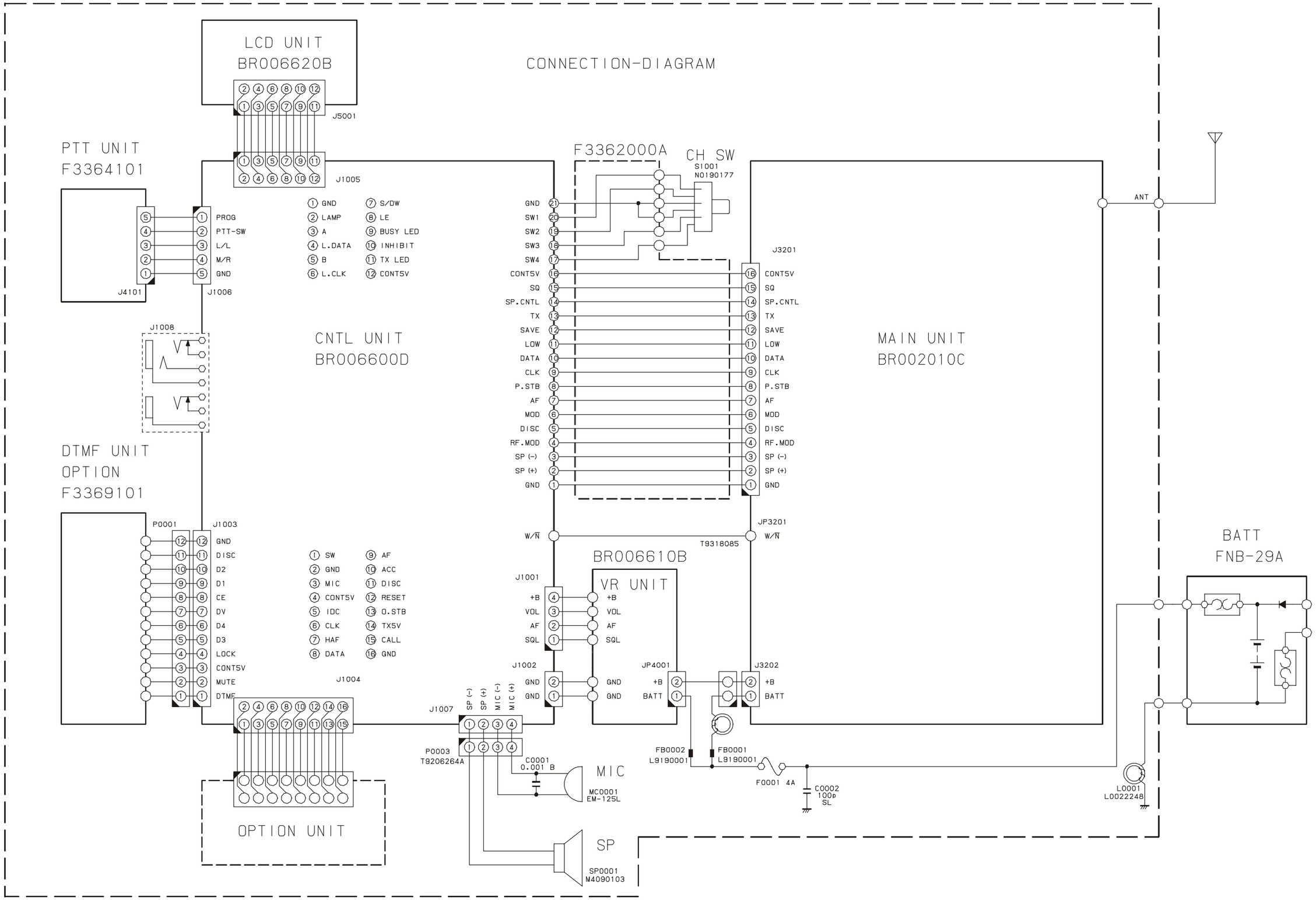
To ensure a sufficient RF ground at the antenna connector during the alignment procedure and when making measurements, install the ground plate by sliding it over the **CN-1A** connector and then insert and tighten the supplied M2.6 x 3 screw into the rear case (see illustration).

Remember to *remove the nut and washer again before assembling the transceiver body halves.*



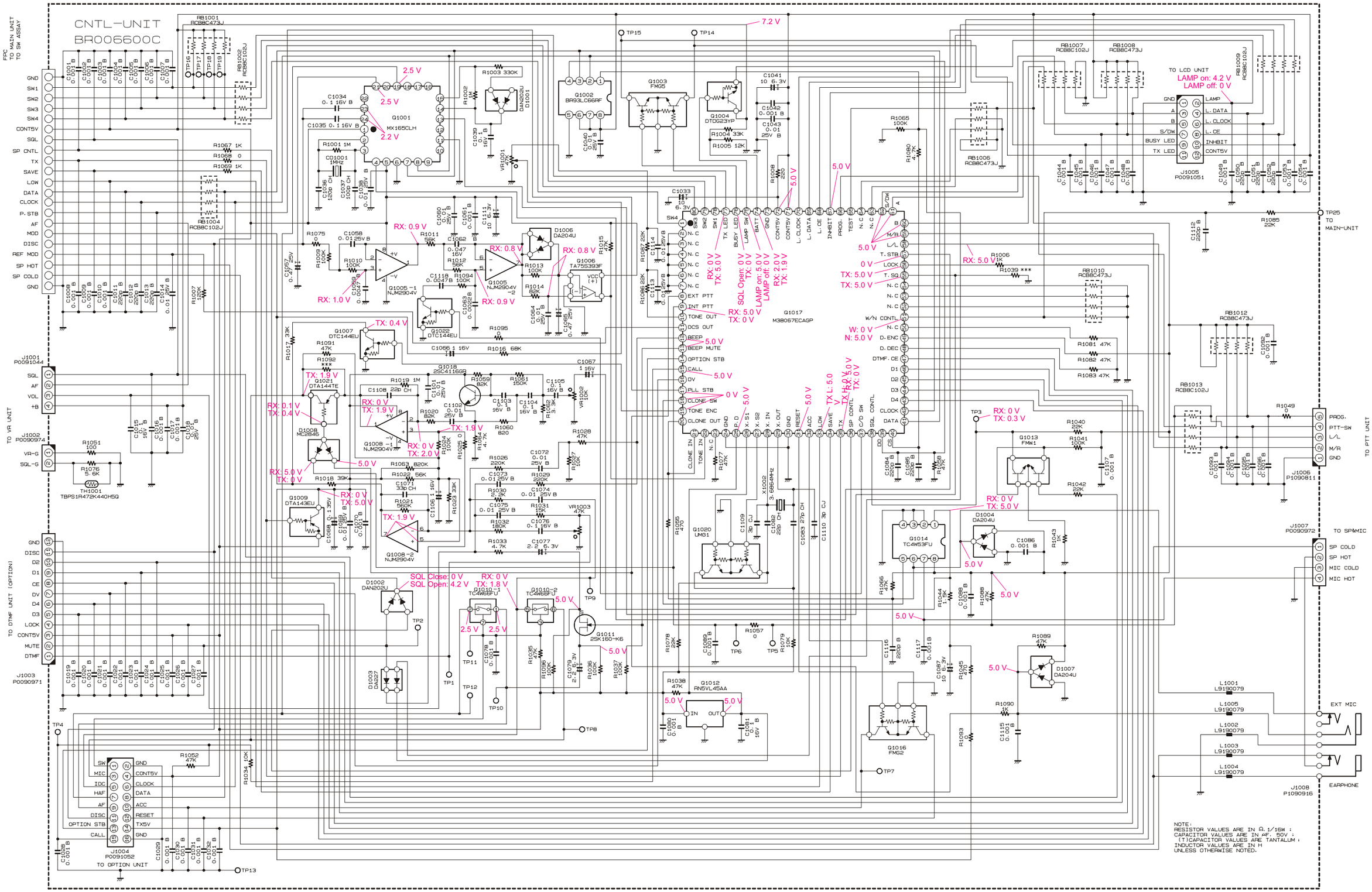
## *Alignment*

***Note:***


CONNECTION-DIAGRAM
LCD UNIT
BR006620B
J5001
J1005
PTT UNIT
F3364101
J4101
J1006
PROG
PTT-SW
L/L
M/R
GND
1 GND
2 LAMP
3 A
4 L.DATA
5 B
6 L.CLK
7 S/DW
8 LE
9 BUSY LED
10 INHIBIT
11 TX LED
12 CONT5V
F3362000A
CH SW
S1001
N0190177
GND
SW1
SW2
SW3
SW4
CONT5V
SQ
SP.CNTL
TX
SAVE
LOW
DATA
CLK
P.STB
AF
MOD
DISC
RF.MOD
SP (-)
SP (+)
GND
J3201
CONT5V
SQ
SP.CNTL
TX
SAVE
LOW
DATA
CLK
P.STB
AF
MOD
DISC
RF.MOD
SP (-)
SP (+)
GND
ANT
J1008
CNTL UNIT
BR006600D
MAIN UNIT
BR002010C
DTMF UNIT
OPTION
F3369101
P0001
J1003
GND
DISC
D2
D1
CE
DV
D4
D3
LOCK
CONT5V
MUTE
DTMF
1 SW
2 GND
3 MIC
4 CONT5V
5 IDC
6 CLK
7 HAF
8 DATA
9 AF
10 ACC
11 DISC
12 RESET
13 O.STB
14 TX5V
15 CALL
16 GND
J1004
W/N
T9318085
JP3201
W/N
BR006610B
VR UNIT
J1001
+B
VOL
AF
SQL
J1002
GND
GND
JP4001
+B
BATT
J3202
+B
BATT
BATT
FNB-29A
J1007
SP (-)
SP (+)
MIC (-)
MIC (+)
P0003
T9206264A
C0001
0.001 B
MIC
MC0001
EM-125L
SP
SP0001
M4090103
FB0002
L9190001
FB0001
L9190001
F0001 4A
C0002
100p
SL
L0001
L0022248
OPTION UNIT

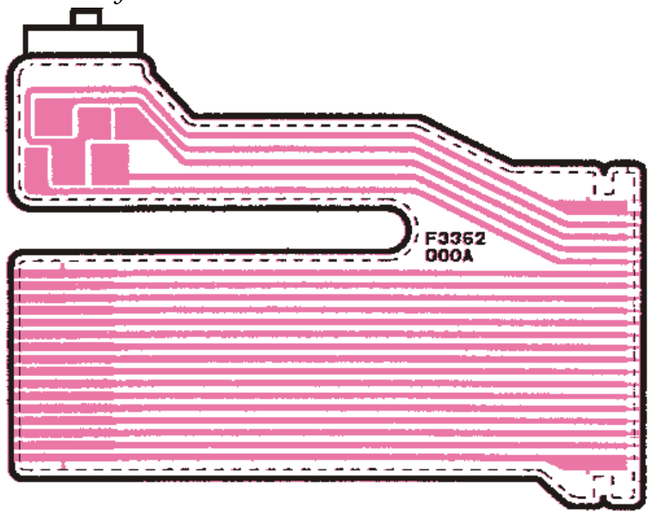
## *Interconnection Diagram*

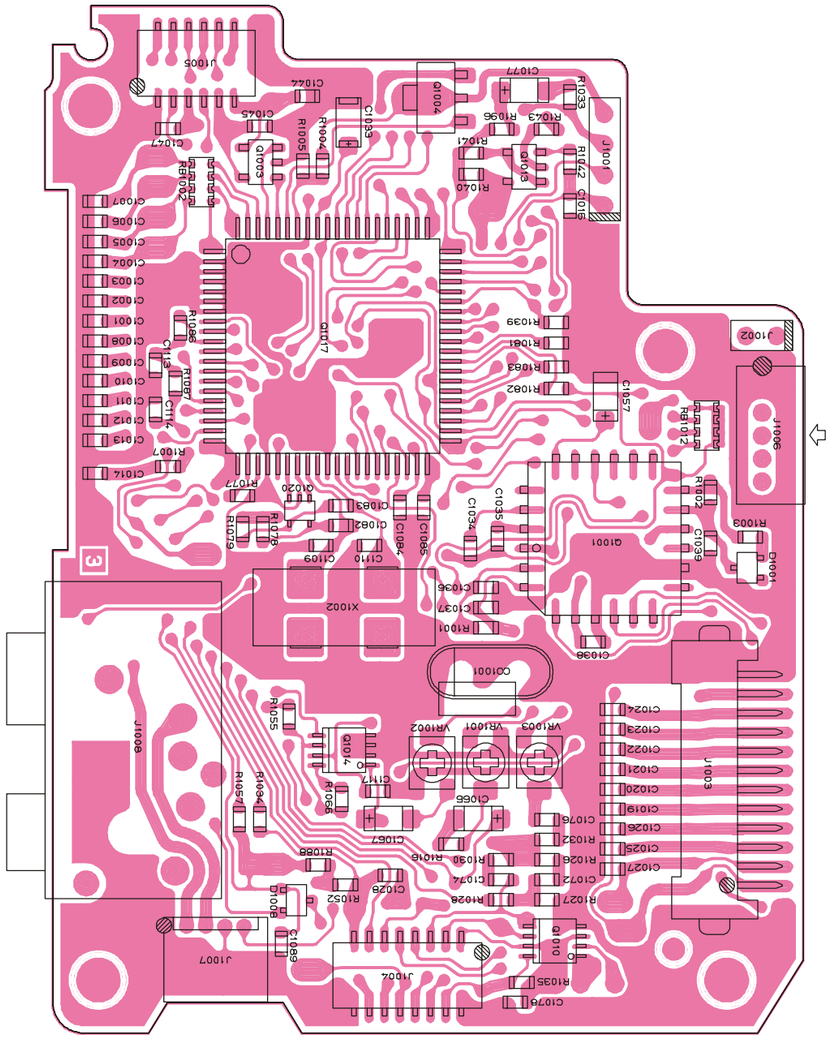
***Note:***


CNTL-UNIT
BR0066600C
FPC TO MAIN UNIT TO SW ASSAY
TO VR UNIT
TO DTMF UNIT (OPTION)
TO LCD UNIT
LAMP on: 4.2 V
LAMP off: 0 V
TO SP&MIC
TO PTT UNIT
TO MAIN-UNIT
EXT MIC
EARPHONE
TO OPTION UNIT
TH1001 TBPS1R472K440H5G
G1017 M38067ECAGP
NOTE:
RESISTOR VALUES ARE IN Ω. 1/16W :
CAPACITOR VALUES ARE IN μF. 50V :
(T)CAPACITOR VALUES ARE TANTALUM :
INDUCTOR VALUES ARE IN H
UNLESS OTHERWISE NOTED.

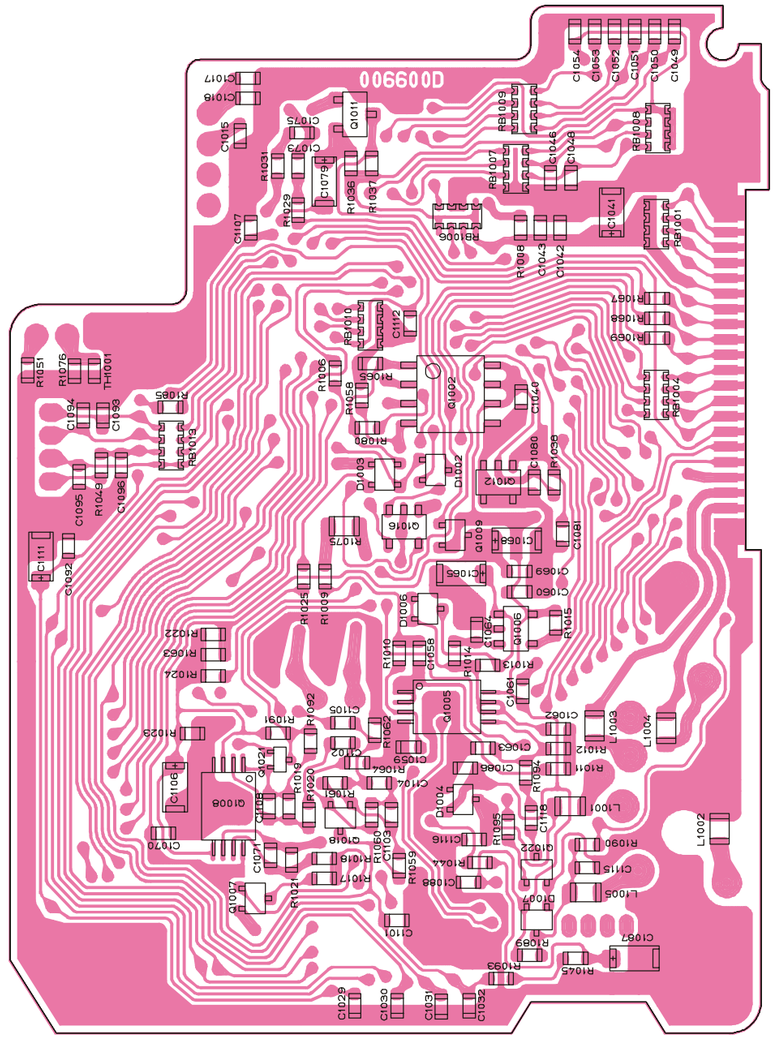
# *CNTL Unit*

## *Parts Layout*

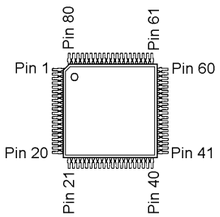


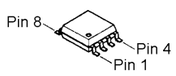
Side A



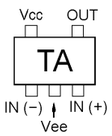

Side B



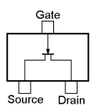

M38067ECA
M38067MC (Lot. 8~)
(Q1017)



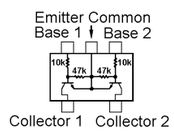

BR93LC66RF
BR93L66RF (Lot. 16~)
(Q1002)
NJM2904V
(Q1005, 1008)



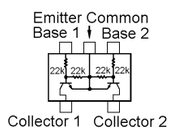

TA75S393F (TA)
(Q1006)



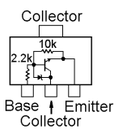

2SK160 (K6)
(Q1011)



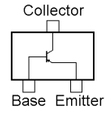

FMG5 (G5)
(Q1003)



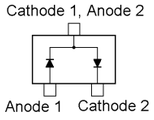

UMG1 (G1)
(Q1020)



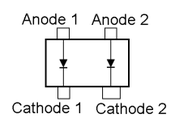

DTDG23YP (E02)
(Q1004)



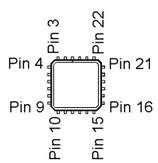

2SA1586Y (SY)
(Q1015)



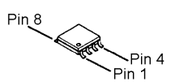

DA204U (K)
(D1004, 1006)



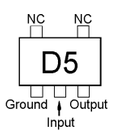

DA227 (N20)
(D1003)



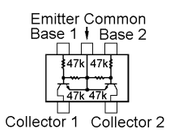

MX165CLH
(Q1001)



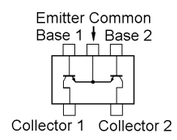

TC4W53FU
(Q1014)
TC4W66FU
(Q1010)



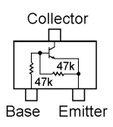

RN5VL45AA (D5)
(Q1012)



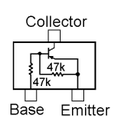

FMG2 (G2)
(Q1016)



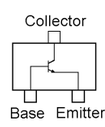

FMW1 (W1)
(Q1013)



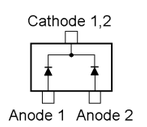

DTC144EU (26)
(Q1007, 1021)




DTA143EU (13)
(Q1009)




2SC4116GR (LG)
(Q1018)




DAN202U (N)
(D1001, 1002, 1005)

## *Parts List*

| REF. | DESCRIPTION | VALUE | V/W | TOL. | MFR'S DESIG | VXSTD P/N | VERS. | LOT. | SIDE |
|---|---|---|---|---|---|---|---|---|---|
| | PCB with Compornents | | | | | CB1467001 | | | |
| | P.C.B. W/O COMP. | | | | | FR006600D | | 1 | |
| C 1001 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 1002 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 1003 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 1004 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 1005 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 1006 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 1007 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 1008 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 1009 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 1010 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 1011 | CHIP CAP. | 220pF | 50V | B | GRM39B221M50PT | K22174801 | | 1- | A |
| C 1012 | CHIP CAP. | 220pF | 50V | B | GRM39B221M50PT | K22174801 | | 1- | A |
| C 1013 | CHIP CAP. | 220pF | 50V | B | GRM39B221M50PT | K22174801 | | 1- | A |
| C 1014 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | | 1- | A |
| C 1015 | CHIP CAP. | 0.1uF | 16V | B | GRM39B104K16PT | K22124805 | | 1- | B |
| C 1016 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 1017 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 1018 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | | 1- | B |
| C 1019 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 1020 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 1021 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 1022 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 1023 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 1024 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 1025 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 1026 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 1027 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 1028 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 1029 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 1030 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 1031 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 1032 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 1033 | CHIP TA.CAP. | 10uF | 6.3V | | TEMSVA0J106M-8R | K78080027 | | 1- | A |
| C 1034 | CHIP CAP. | 0.1uF | 16V | B | GRM39B104K16PT | K22124805 | | 1- | A |
| C 1035 | CHIP CAP. | 0.1uF | 16V | B | GRM39B104K16PT | K22124805 | | 1- | A |
| C 1036 | CHIP CAP. | 120pF | 50V | CH | GRM39CH121J50PT | K22174237 | | 1- | A |
| C 1037 | CHIP CAP. | 100pF | 50V | CH | GRM39CH101J50PT | K22174235 | | 1- | A |
| C 1038 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | | 1- | A |
| C 1039 | CHIP CAP. | 0.1uF | 16V | B | GRM39B104K16PT | K22124805 | | 1- | A |
| C 1040 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | | 1- | B |
| C 1041 | CHIP TA.CAP. | 10uF | 6.3V | | TEMSVA0J106M-8R | K78080027 | | 1- | B |
| C 1042 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 1043 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | | 1- | B |
| C 1044 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 1045 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 1046 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 1047 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 1048 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 1049 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 1050 | CHIP CAP. | 220pF | 50V | B | GRM39B221M50PT | K22174801 | | 1- | B |
| C 1051 | CHIP CAP. | 220pF | 50V | B | GRM39B221M50PT | K22174801 | | 1- | B |
| C 1052 | CHIP CAP. | 220pF | 50V | B | GRM39B221M50PT | K22174801 | | 1- | B |
| C 1053 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 1054 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 1057 | CHIP TA.CAP. | 0.47uF | 25V | | TESVA1E474M1-8R | K78140009 | | 1- | A |
| C 1058 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | | 1- | B |
| C 1059 | CHIP CAP. | 0.0047uF | 50V | B | GRM39B472K50PT | K22174833 | | 1- | B |
| C 1060 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | | 1- | B |

# *CNTL Unit*

| REF. | DESCRIPTION | VALUE | V/W | TOL. | MFR'S DESIG | VXSTD P/N | VERS. | LOT. | SIDE |
|---|---|---|---|---|---|---|---|---|---|
| C 1061 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 1062 | CHIP CAP. | 0.047uF | 16V | B | GRM39B473K16PT | K22124804 | | 1- | B |
| C 1063 | CHIP CAP. | 0.0022uF | 50V | B | GRM39B222K50PT | K22174822 | | 1- | B |
| C 1064 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | | 1- | B |
| C 1065 | CHIP TA.CAP. | 0.47uF | 25V | | TESVA1E474M1-8R | K78140009 | | 1- | B |
| C 1066 | CHIP TA.CAP. | 1uF | 16V | | TESVA1C105M1-8R | K78120009 | | 1- | A |
| C 1067 | CHIP TA.CAP. | 1uF | 16V | | TESVA1C105M1-8R | K78120009 | | 1- | A |
| C 1068 | CHIP TA.CAP. | 0.1uF | 35V | | TESVA1V104M1-8R | K78160025 | | 1- | B |
| C 1069 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | | 1- | B |
| C 1070 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 1071 | CHIP CAP. | 33pF | 50V | CH | GRM39CH330J50PT | K22174223 | | 1- | B |
| C 1072 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | | 1- | A |
| C 1073 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | | 1- | B |
| C 1074 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | | 1- | A |
| C 1075 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | | 1-10 | B |
| C 1075 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | VX-520U | 11- | B |
| C 1076 | CHIP CAP. | 0.1uF | 16V | B | GRM39B104K16PT | K22124805 | | 1-10 | A |
| C 1076 | CHIP CAP. | 0.1uF | 16V | B | GRM39B104K16PT | K22124805 | VX-520U | 11- | A |
| C 1076 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | VX-520UN | 11- | A |
| C 1077 | CHIP TA.CAP. | 2.2uF | 6.3V | | TESVA0J225M1-8R | K78080009 | | 1- | A |
| C 1078 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 1079 | CHIP TA.CAP. | 2.2uF | 6.3V | | TESVA0J225M1-8R | K78080009 | | 1- | B |
| C 1080 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 1081 | CHIP CAP. | 0.1uF | 16V | B | GRM39B104K16PT | K22124805 | | 1- | B |
| C 1082 | CHIP CAP. | 22pF | 50V | CH | GRM39CH220J50PT | K22174219 | | 1- | A |
| C 1083 | CHIP CAP. | 27pF | 50V | CH | GRM39CH270J50PT | K22174221 | | 1- | A |
| C 1084 | CHIP CAP. | 220pF | 50V | B | GRM39B221M50PT | K22174801 | | 1- | A |
| C 1085 | CHIP CAP. | 220pF | 50V | B | GRM39B221M50PT | K22174801 | | 1- | A |
| C 1086 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 1087 | CHIP TA.CAP. | 10uF | 6.3V | | TEMSVA0J106M-8R | K78080027 | | 1- | B |
| C 1088 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 1089 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 1092 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 1093 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 1094 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 1095 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 1096 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 1101 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | | 1- | B |
| C 1102 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | | 1- | B |
| C 1103 | CHIP CAP. | 0.1uF | 16V | B | GRM39B104K16PT | K22124805 | | 1- | B |
| C 1104 | CHIP CAP. | 0.1uF | 16V | B | GRM39B104K16PT | K22124805 | | 1- | B |
| C 1105 | CHIP CAP. | 0.1uF | 16V | B | GRM39B104K16PT | K22124805 | | 1- | B |
| C 1106 | CHIP TA.CAP. | 1uF | 16V | | TESVA1C105M1-8R | K78120009 | | 1- | B |
| C 1107 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 1108 | CHIP CAP. | 22pF | 50V | CH | GRM39CH220J50PT | K22174219 | | 1- | B |
| C 1109 | CHIP CAP. | 3pF | 50V | CJ | GRM39CJ030C50PT | K22174204 | | 1- | A |
| C 1110 | CHIP CAP. | 3pF | 50V | CJ | GRM39CJ030C50PT | K22174204 | | 1- | A |
| C 1111 | CHIP TA.CAP. | 10uF | 6.3V | | TEMSVA0J106M-8R | K78080027 | | 1- | B |
| C 1112 | CHIP CAP. | 220pF | 50V | B | GRM39B221M50PT | K22174801 | | 1- | B |
| C 1113 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | | 1- | A |
| C 1114 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | | 1- | A |
| C 1115 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 1116 | CHIP CAP. | 220pF | 50V | B | GRM39B221M50PT | K22174801 | | 1- | B |
| C 1117 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 1118 | CHIP CAP. | 0.0047uF | 50V | B | GRM39B472K50PT | K22174833 | | 1- | B |
| CO1001 | CERAMIC OSC | 1MHz | | | CSB1000J | H7901230 | | 1- | A |
| D 1001 | DIODE | | | | DAN202U T106 | G2070162 | | 1- | A |
| D 1002 | DIODE | | | | DAN202U T106 | G2070162 | | 1- | B |
| D 1003 | DIODE | | | | DA227-TR | G2070292 | | 1- | B |
| D 1004 | DIODE | | | | DA204U T106 | G2070242 | | 1- | B |

| REF. | DESCRIPTION | VALUE | V/W | TOL. | MFR'S DESIG | VXSTD P/N | VERS. | LOT. | SIDE |
|---|---|---|---|---|---|---|---|---|---|
| D 1005 | DIODE | | | | 1SS355 TE-17 | G2070470 | | 3- | A |
| D 1006 | DIODE | | | | DA204U T106 | G2070242 | | 1- | B |
| D 1007 | DIODE | | | | DA204U T106 | G2070242 | | 1- | B |
| D 1008 | DIODE | | | | MC2846-T11-1 | G2070702 | | 1- | A |
| J 1001 | CONNECTOR | | | | 9213B-1-04Z010-T | P0091044 | | 1- | A |
| J 1002 | CONNECTOR | | | | 9213B-1-02Z006-T | P0090974 | | 1- | A |
| J 1003 | CONNECTOR | | | | IL-Z-12PL-SMTY-E1500 | P0090971 | | 1- | A |
| J 1004 | CONNECTOR | | | | 53263-1690 | P0091052 | | 1- | A |
| J 1005 | CONNECTOR | | | | 53263-1290 | P0091051 | | 1- | A |
| J 1006 | CONNECTOR | | | | 9120S-05A | P1090811 | | 1- | A |
| J 1007 | CONNECTOR | | | | 53048-0410 | P0090972 | | 1- | A |
| J 1008 | CONNECTOR | | | | HSJ1468-01-130 | P1090916 | | 1- | A |
| L 1001 | FERRITE BEADS | | | | BK2125HS121-T | L9190079 | | 1- | B |
| L 1002 | FERRITE BEADS | | | | BK2125HS121-T | L9190079 | | 1- | B |
| L 1003 | FERRITE BEADS | | | | BK2125HS121-T | L9190079 | | 1- | B |
| L 1004 | FERRITE BEADS | | | | BK2125HS121-T | L9190079 | | 1- | B |
| L 1005 | FERRITE BEADS | | | | BK2125HS121-T | L9190079 | | 1- | B |
| Q 1001 | IC | | | | MX165CLH-TR | G1092010 | | 1- | A |
| Q 1002 | IC | | | | BR93LC66RF-E2 | G1092006 | | 1- | B |
| Q 1002 | IC | | | | BR93L66RF-WE2 | G1093912 | | 16- | B |
| Q 1003 | TRANSISTOR | | | | FMG5 T148 | G3070021 | | 1- | A |
| Q 1004 | TRANSISTOR | | | | DTDG23YP T100 | G3070198 | | 1- | A |
| Q 1005 | IC | | | | NJM2904V-TE1 | G1091677 | | 1- | B |
| Q 1006 | IC | | | | TA75S393F TE85R | G1091589 | | 1- | B |
| Q 1007 | TRANSISTOR | | | | DTC144EU T106 | G3070041 | | 1- | B |
| Q 1008 | IC | | | | NJM2904V-TE1 | G1091677 | | 1- | B |
| Q 1009 | TRANSISTOR | | | | DTA143EU T106 | G3070110 | | 1- | B |
| Q 1010 | IC | | | | TC4W66FU TE12L | G1091676 | | 1- | A |
| Q 1011 | FET | | | | 2SK160-T2B K6 | G3801607F | | 1- | B |
| Q 1012 | IC | | | | RN5VL45AA-TR | G1091552 | | 1- | B |
| Q 1013 | TRANSISTOR | | | | FMW1 T98 | G3070009 | | 1- | A |
| Q 1014 | IC | | | | TC4W53FU TE12L | G1091675 | | 1- | A |
| Q 1016 | TRANSISTOR | | | | FMG2 T148 | G3070015 | | 1- | B |
| Q 1017 | IC | | | | M38067ECAGP | ※ | | 1- | A |
| Q 1017 | IC | | | | M38067MC-463GP | ※ | | 8- | A |
| Q 1017 | IC | | | | M38067MC-470GP | ※ | | 13- | A |
| Q 1018 | TRANSISTOR | | | | 2SC4116GR TE85R | G3341167G | | 1- | B |
| Q 1020 | TRANSISTOR | | | | UMG1 TR | G3070113 | | 1- | A |
| Q 1021 | TRANSISTOR | | | | DTA144TE TL | G3070209 | | 1- | B |
| Q 1022 | TRANSISTOR | | | | DTC144EU T106 | G3070041 | | 1- | B |
| R 1001 | CHIP RES. | 1M | 1/16W | 5% | RMC1/16 105JATP | J24185105 | | 1- | A |
| R 1002 | CHIP RES. | 1M | 1/16W | 5% | RMC1/16 105JATP | J24185105 | | 1- | A |
| R 1003 | CHIP RES. | 330k | 1/16W | 5% | RMC1/16 334JATP | J24185334 | | 1- | A |
| R 1004 | CHIP RES. | 33k | 1/16W | 5% | RMC1/16 333JATP | J24185333 | | 1- | A |
| R 1005 | CHIP RES. | 12k | 1/16W | 5% | RMC1/16 123JATP | J24185123 | | 1- | A |
| R 1006 | CHIP RES. | 1k | 1/16W | 5% | RMC1/16 102JATP | J24185102 | | 1- | B |
| R 1007 | CHIP RES. | 120k | 1/16W | 5% | RMC1/16 124JATP | J24185124 | | 1- | A |
| R 1008 | CHIP RES. | 220 | 1/16W | 5% | RMC1/16 221JATP | J24185221 | | 1- | B |
| R 1008 | CHIP RES. | 10 | 1/16W | 5% | RMC1/16 100JATP | J24185100 | | 3- | B |
| R 1009 | CHIP RES. | 100k | 1/16W | 5% | RMC1/16 104JATP | J24185104 | | 1- | B |
| R 1010 | CHIP RES. | 100k | 1/16W | 5% | RMC1/16 104JATP | J24185104 | | 1- | B |
| R 1011 | CHIP RES. | 56k | 1/16W | 5% | RMC1/16 563JATP | J24185563 | | 1- | B |
| R 1012 | CHIP RES. | 56k | 1/16W | 5% | RMC1/16 563JATP | J24185563 | | 1- | B |
| R 1013 | CHIP RES. | 100k | 1/16W | 5% | RMC1/16 104JATP | J24185104 | | 1- | B |
| R 1014 | CHIP RES. | 82k | 1/16W | 5% | RMC1/16 823JATP | J24185823 | | 1- | B |
| R 1015 | CHIP RES. | 47k | 1/16W | 5% | RMC1/16 473JATP | J24185473 | | 1- | B |
| R 1016 | CHIP RES. | 68k | 1/16W | 5% | RMC1/16 683JATP | J24185683 | | 1- | A |
| R 1017 | CHIP RES. | 33k | 1/16W | 5% | RMC1/16 333JATP | J24185333 | | 1- | B |
| R 1018 | CHIP RES. | 39k | 1/16W | 5% | RMC1/16 393JATP | J24185393 | | 1- | B |
| R 1019 | CHIP RES. | 1M | 1/16W | 5% | RMC1/16 105JATP | J24185105 | | 1- | B |

※Please contact VERTEX STANDARD.

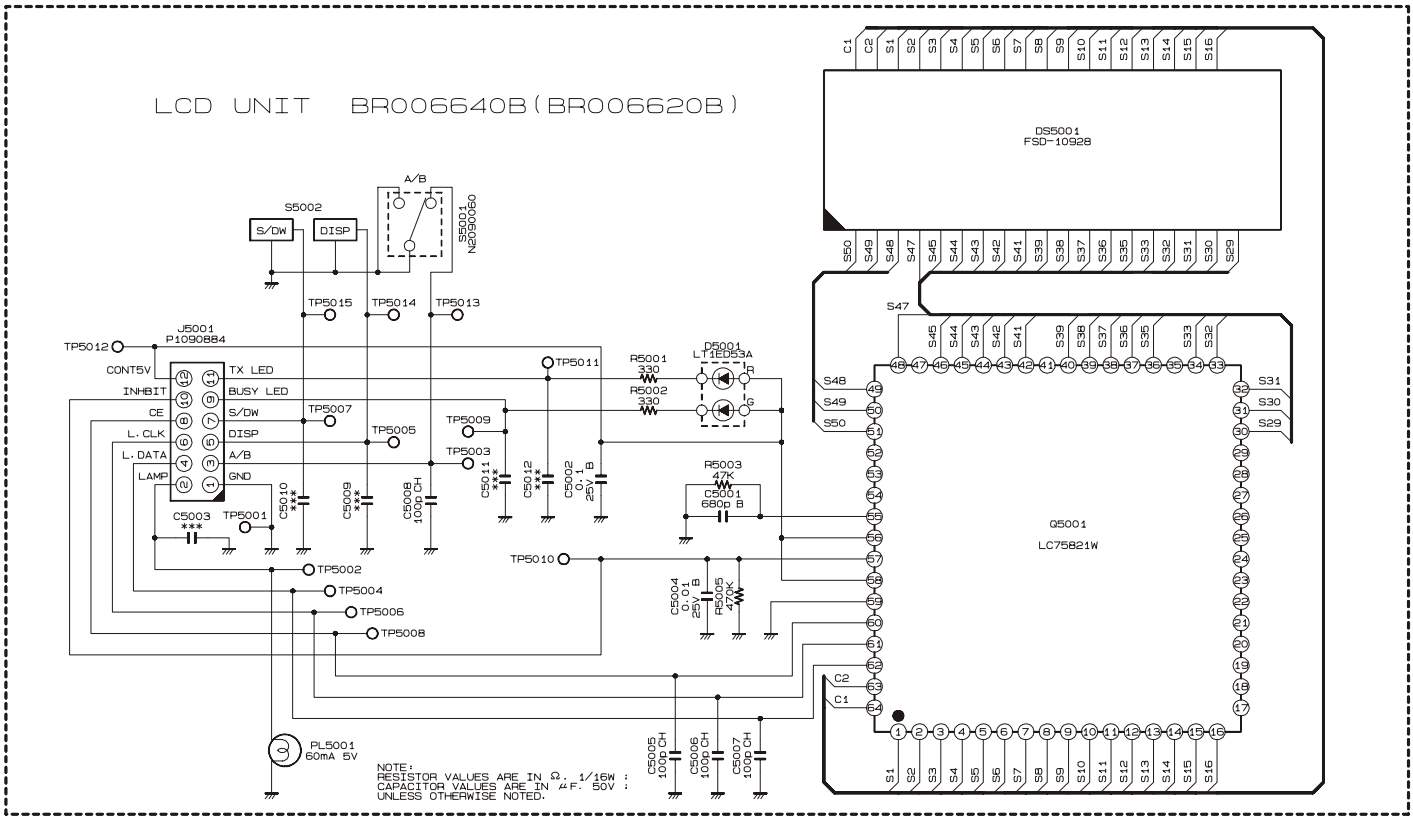
| REF. | DESCRIPTION | VALUE | V/W | TOL. | MFR'S DESIG | VXSTD P/N | VERS. | LOT. | SIDE |
|---|---|---|---|---|---|---|---|---|---|
| R 1020 | CHIP RES. | 82k | 1/16W | 5% | RMC1/16 823JATP | J24185823 | | 1- | B |
| R 1021 | CHIP RES. | 560k | 1/16W | 5% | RMC1/16 564JATP | J24185564 | | 1- | B |
| R 1022 | CHIP RES. | 56k | 1/16W | 5% | RMC1/16 563JATP | J24185563 | | 1- | B |
| R 1023 | CHIP RES. | 33k | 1/16W | 5% | RMC1/16 333JATP | J24185333 | | 1- | B |
| R 1024 | CHIP RES. | 100k | 1/16W | 5% | RMC1/16 104JATP | J24185104 | | 1- | B |
| R 1025 | CHIP RES. | 0 | 1/16W | 5% | RMC1/16 000JATP | J24185000 | | 1- | B |
| R 1026 | CHIP RES. | 220k | 1/16W | 5% | RMC1/16 224JATP | J24185224 | | 1- | A |
| R 1027 | CHIP RES. | 10k | 1/16W | 5% | RMC1/16 103JATP | J24185103 | | 1- | A |
| R 1028 | CHIP RES. | 47k | 1/16W | 5% | RMC1/16 473JATP | J24185473 | | 1- | A |
| R 1029 | CHIP RES. | 220k | 1/16W | 5% | RMC1/16 224JATP | J24185224 | | 1- | B |
| R 1030 | CHIP RES. | 2.2k | 1/16W | 5% | RMC1/16 222JATP | J24185222 | | 1- | A |
| R 1031 | CHIP RES. | 15k | 1/16W | 5% | RMC1/16 153JATP | J24185153 | | 1-10 | B |
| R 1031 | CHIP RES. | 15k | 1/16W | 5% | RMC1/16 153JATP | J24185153 | VX-520U | 11- | B |
| R 1032 | CHIP RES. | 180k | 1/16W | 5% | RMC1/16 184JATP | J24185184 | | 1-10 | A |
| R 1032 | CHIP RES. | 180k | 1/16W | 5% | RMC1/16 184JATP | J24185184 | VX-520U | 11- | A |
| R 1032 | CHIP RES. | 15k | 1/16W | 5% | RMC1/16 153JATP | J24185153 | VX-520UN | 11- | A |
| R 1033 | CHIP RES. | 4.7k | 1/16W | 5% | RMC1/16 472JATP | J24185472 | | 1- | A |
| R 1034 | CHIP RES. | 10k | 1/16W | 5% | RMC1/16 103JATP | J24185103 | | 1- | A |
| R 1035 | CHIP RES. | 47k | 1/16W | 5% | RMC1/16 473JATP | J24185473 | | 1- | A |
| R 1036 | CHIP RES. | 100k | 1/16W | 5% | RMC1/16 104JATP | J24185104 | | 1- | B |
| R 1037 | CHIP RES. | 100k | 1/16W | 5% | RMC1/16 104JATP | J24185104 | | 1- | B |
| R 1038 | CHIP RES. | 47k | 1/16W | 5% | RMC1/16 473JATP | J24185473 | | 1- | B |
| R 1040 | CHIP RES. | 22k | 1/16W | 5% | RMC1/16 223JATP | J24185223 | | 1- | A |
| R 1041 | CHIP RES. | 100k | 1/16W | 5% | RMC1/16 104JATP | J24185104 | | 1- | A |
| R 1042 | CHIP RES. | 22k | 1/16W | 5% | RMC1/16 223JATP | J24185223 | | 1- | A |
| R 1043 | CHIP RES. | 1k | 1/16W | 5% | RMC1/16 102JATP | J24185102 | | 1- | A |
| R 1044 | CHIP RES. | 1.5k | 1/16W | 5% | RMC1/16 152JATP | J24185152 | | 1- | B |
| R 1045 | CHIP RES. | 470 | 1/16W | 5% | RMC1/16 471JATP | J24185471 | | 1- | B |
| R 1049 | CHIP RES. | 0 | 1/16W | 5% | RMC1/16 000JATP | J24185000 | | 1- | B |
| R 1051 | CHIP RES. | 100 | 1/16W | 5% | RMC1/16 101JATP | J24185101 | | 1- | B |
| R 1052 | CHIP RES. | 47k | 1/16W | 5% | RMC1/16 473JATP | J24185473 | | 1- | A |
| R 1055 | CHIP RES. | 470 | 1/16W | 5% | RMC1/16 471JATP | J24185471 | | 1- | A |
| R 1057 | CHIP RES. | 0 | 1/16W | 5% | RMC1/16 000JATP | J24185000 | | 1- | A |
| R 1057 | CHIP RES. | 10k | 1/16W | 5% | RMC1/16 103JATP | J24185103 | | 3- | A |
| R 1058 | CHIP RES. | 47k | 1/16W | 5% | RMC1/16 473JATP | J24185473 | | 1- | B |
| R 1059 | CHIP RES. | 82k | 1/16W | 5% | RMC1/16 823JATP | J24185823 | | 1- | B |
| R 1060 | CHIP RES. | 820 | 1/16W | 5% | RMC1/16 821JATP | J24185821 | | 1- | B |
| R 1061 | CHIP RES. | 150k | 1/16W | 5% | RMC1/16 154JATP | J24185154 | | 1- | B |
| R 1062 | CHIP RES. | 3.3k | 1/16W | 5% | RMC1/16 332JATP | J24185332 | | 1- | B |
| R 1063 | CHIP RES. | 820k | 1/16W | 5% | RMC1/16 824JATP | J24185824 | | 1- | B |
| R 1064 | CHIP RES. | 4.7k | 1/16W | 5% | RMC1/16 472JATP | J24185472 | | 1- | B |
| R 1065 | CHIP RES. | 100k | 1/16W | 5% | RMC1/16 104JATP | J24185104 | | 1- | B |
| R 1066 | CHIP RES. | 47k | 1/16W | 5% | RMC1/16 473JATP | J24185473 | | 1- | A |
| R 1067 | CHIP RES. | 1k | 1/16W | 5% | RMC1/16 102JATP | J24185102 | | 1- | B |
| R 1068 | CHIP RES. | 0 | 1/16W | 5% | RMC1/16 000JATP | J24185000 | | 1- | B |
| R 1069 | CHIP RES. | 1k | 1/16W | 5% | RMC1/16 102JATP | J24185102 | | 1- | B |
| R 1075 | CHIP RES. | 0 | 1/10W | 5% | RMC1/10T 000J | J24205000 | | 1- | B |
| R 1076 | CHIP RES. | 5.6k | 1/16W | 5% | RMC1/16 562JATP | J24185562 | | 1- | B |
| R 1077 | CHIP RES. | 47k | 1/16W | 5% | RMC1/16 473JATP | J24185473 | | 1- | A |
| R 1078 | CHIP RES. | 22k | 1/16W | 5% | RMC1/16 223JATP | J24185223 | | 1- | A |
| R 1079 | CHIP RES. | 10k | 1/16W | 5% | RMC1/16 103JATP | J24185103 | | 1- | A |
| R 1080 | CHIP RES. | 4.7k | 1/16W | 5% | RMC1/16 472JATP | J24185472 | | 1- | B |
| R 1081 | CHIP RES. | 47k | 1/16W | 5% | RMC1/16 473JATP | J24185473 | | 1- | A |
| R 1082 | CHIP RES. | 47k | 1/16W | 5% | RMC1/16 473JATP | J24185473 | | 1- | A |
| R 1083 | CHIP RES. | 47k | 1/16W | 5% | RMC1/16 473JATP | J24185473 | | 1- | A |
| R 1085 | CHIP RES. | 22k | 1/16W | 5% | RMC1/16 223JATP | J24185223 | | 1- | B |
| R 1086 | CHIP RES. | 22k | 1/16W | 5% | RMC1/16 223JATP | J24185223 | | 1- | A |
| R 1087 | CHIP RES. | 22k | 1/16W | 5% | RMC1/16 223JATP | J24185223 | | 1- | A |
| R 1088 | CHIP RES. | 47k | 1/16W | 5% | RMC1/16 473JATP | J24185473 | | 1- | A |
| R 1089 | CHIP RES. | 47k | 1/16W | 5% | RMC1/16 473JATP | J24185473 | | 1- | B |

| REF. | DESCRIPTION | VALUE | V/W | TOL. | MFR'S DESIG | VXSTD P/N | VERS. | LOT. | SIDE |
|---|---|---|---|---|---|---|---|---|---|
| R 1090 | CHIP RES. | 1k | 1/16W | 5% | RMC1/16 102JATP | J24185102 | | 1- | B |
| R 1090 | CHIP RES. | 10k | 1/16W | 5% | RMC1/16 103JATP | J24185103 | | 3- | B |
| R 1091 | CHIP RES. | 47k | 1/16W | 5% | RMC1/16 473JATP | J24185473 | | 1- | B |
| R 1093 | CHIP RES. | 0 | 1/16W | 5% | RMC1/16 000JATP | J24185000 | | 1- | B |
| R 1094 | CHIP RES. | 100k | 1/16W | 5% | RMC1/16 104JATP | J24185104 | | 1- | B |
| R 1095 | CHIP RES. | 0 | 1/16W | 5% | RMC1/16 000JATP | J24185000 | | 1- | B |
| R 1096 | CHIP RES. | 100k | 1/16W | 5% | RMC1/16 104JATP | J24185104 | | 1- | A |
| RB1001 | BLOCK RES. | | | | RCB8C473J5E5A | J42900006 | | 1- | B |
| RB1002 | BLOCK RES. | | | | RCB8C102J5E5A | J42900005 | | 1- | A |
| RB1004 | BLOCK RES. | | | | RCB8C102J5E5A | J42900005 | | 1- | B |
| RB1006 | BLOCK RES. | | | | RCB8C473J5E5A | J42900006 | | 1- | B |
| RB1007 | BLOCK RES. | | | | RCB8C102J5E5A | J42900005 | | 1- | B |
| RB1008 | BLOCK RES. | | | | RCB8C473J5E5A | J42900006 | | 1- | B |
| RB1009 | BLOCK RES. | | | | RCB8C102J5E5A | J42900005 | | 1- | B |
| RB1010 | BLOCK RES. | | | | RCB8C473J5E5A | J42900006 | | 1- | B |
| RB1012 | BLOCK RES. | | | | RCB8C473J5E5A | J42900006 | | 1- | A |
| RB1013 | BLOCK RES. | | | | RCB8C102J5E5A | J42900005 | | 1- | B |
| TH1001 | THERMISTOR | | | | TBPS1R472K440H5Q | G9090066 | | 1- | B |
| VR1001 | POT. | 47k | | | RH03A3AS4X 47K | J51807473 | | 1- | A |
| VR1002 | POT. | 10k | | | RH03A3A14X 10K | J51807103 | | 1- | A |
| VR1003 | POT. | 47k | | | RH03A3AS4X 47K | J51807473 | | 1- | A |
| X 1002 | XTAL FCX-01 | 3.6864MHz | | | 3.6864MHZ | H0103062 | | 1- | A |
| | SHIELD PLATE | | | | | R0146880 | | 1- | |

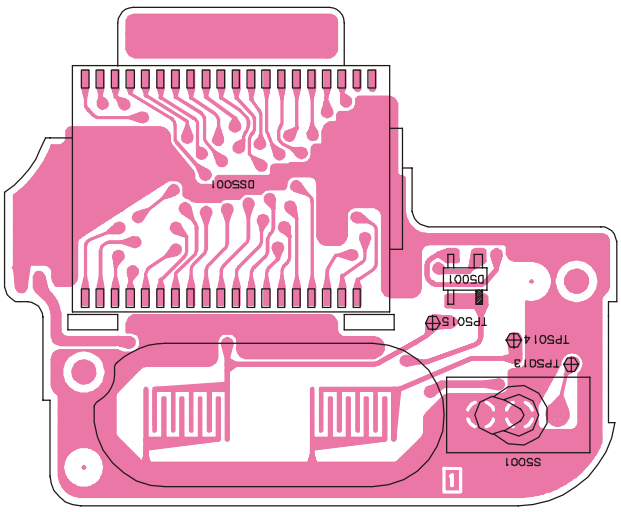
## *CNTL Unit*

***Note:***

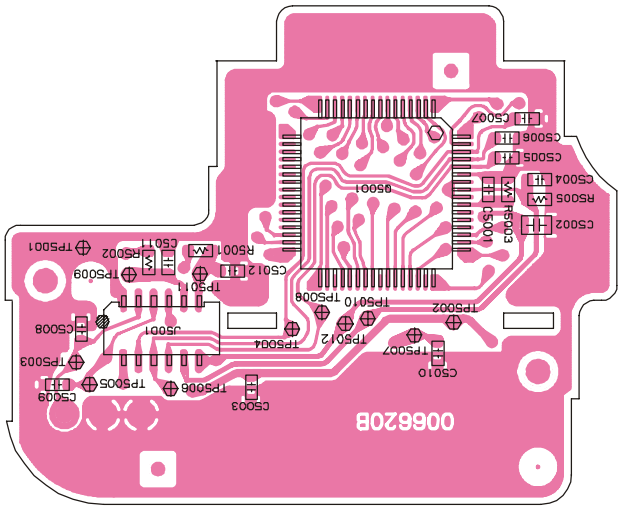
## Circuit Diagram



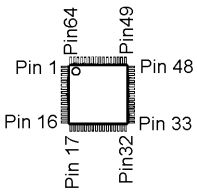

## Parts Layout



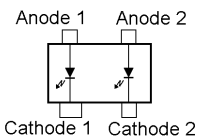
Side A



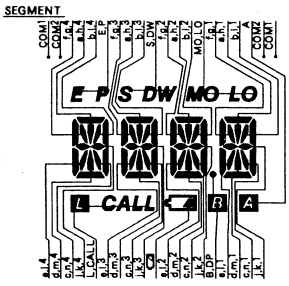
Side B

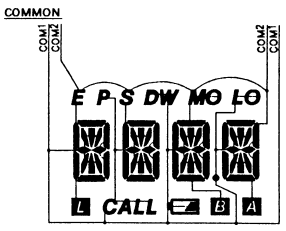



LC75821E
(Q5001)




LT1ED53A
(D5001)



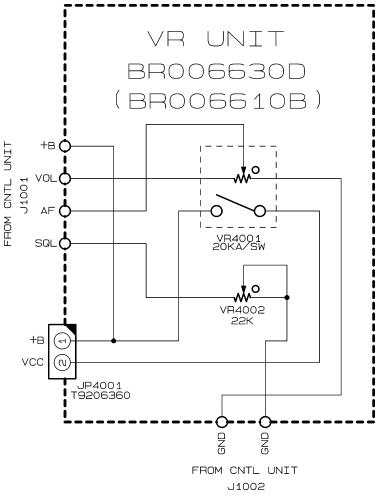

FSD-10928 (DS5001) Circuit Diagram

# *LCD Unit*

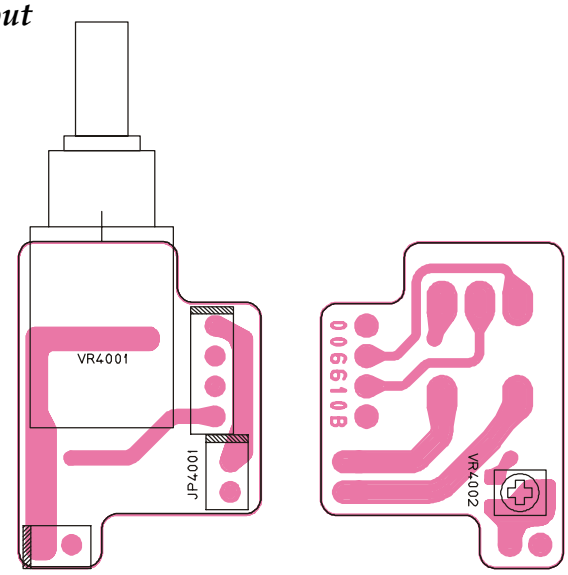
## *Parts List*

| REF. | DESCRIPTION | VALUE | V/W | TOL. | MFR'S DESIG | VXSTD P/N | VERS. | LOT. | SIDE |
|---|---|---|---|---|---|---|---|---|---|
| | PCB with Compornents | | | | | CB1470001 | | | |
| | P.C.B. W/O COMP | | | | AC021U000 | FR006620B | | 1 | |
| C 5001 | CHIP CAP. | 680pF | 50V | B | GRM39B681M50PT | K22174807 | | 1- | B |
| C 5002 | CHIP CAP. | 0.1uF | 25V | B | GRM40B104M25PT | K22140811 | | 1- | B |
| C 5003 | CHIP CAP. | 47pF | 50V | CH | GRM39CH470J50PT | K22174227 | | 1- | B |
| C 5004 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | | 1- | B |
| C 5005 | CHIP CAP. | 100pF | 50V | CH | GRM39CH101J50PT | K22174235 | | 1- | B |
| C 5006 | CHIP CAP. | 100pF | 50V | CH | GRM39CH101J50PT | K22174235 | | 1- | B |
| C 5007 | CHIP CAP. | 100pF | 50V | CH | GRM39CH101J50PT | K22174235 | | 1- | B |
| C 5008 | CHIP CAP. | 100pF | 50V | CH | GRM39CH101J50PT | K22174235 | | 1- | B |
| D 5001 | LED | | | | LT1ED53A | G2070548 | | 1- | A |
| DS5001 | LCD | | | | FSD-10928 | G6090093 | | 1- | A |
| J 5001 | CONNECTOR | | | | 52357-1290 | P1090884 | | 1- | B |
| PL5001 | LAMP | 60mA | 5V | | 5V60MA T-3/4 #6153 | Q1000092 | | 1- | B |
| Q 5001 | IC | | | | LC75821W | G1093333 | | 1- | B |
| R 5001 | CHIP RES. | 330 | 1/16W | 5% | RMC1/16 331JATP | J24185331 | | 1- | B |
| R 5002 | CHIP RES. | 330 | 1/16W | 5% | RMC1/16 331JATP | J24185331 | | 1- | B |
| R 5003 | CHIP RES. | 47k | 1/16W | 5% | RMC1/16 473JATP | J24185473 | | 1- | B |
| R 5005 | CHIP RES. | 470k | 1/16W | 5% | RMC1/16 474JATP | J24185474 | | 1- | B |
| S 5001 | TOGGLE SWITCH | | | | ATE1D-2M3-10 | N2090060 | | 1- | A |
| | LIGHT GUIDE | | | | | RA0078200 | | 1- | |
| | LCD GUIDE | | | | | RA0078300 | | 1- | |
| | RUBBER CONNECTOR | | | | | RA0078100 | | 1- | |
| | REFLECTOR SHEET | | | | | RA0077800 | | 1- | |
| | DIFFUSER SHEET | | | | | RA0078900 | | 1- | |
| | COLOR FILTER | | | | | RA0078000 | | 1- | |

## VR Unit Circuit Diagram




## VR Unit Parts Layout

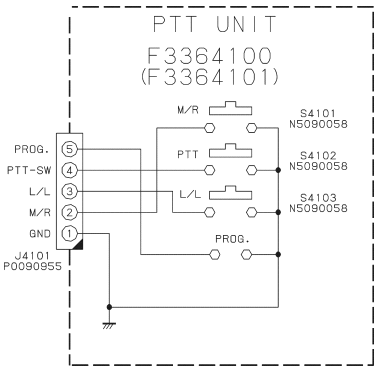



Side A Side B

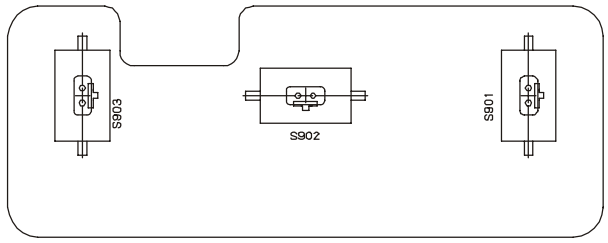
## Parts List

| REF. | DESCRIPTION | VALUE | V/W | TOL. | MFR'S DESIG | VXSTD P/N | VERS. | LOT. |
|---|---|---|---|---|---|---|---|---|
| | PCB with Compornents | | | | | CB1468001 | | |
| | Printed Circuit Board | | | | | FR006610B | | 1- |
| JP4001 | WIRE ASSY | | | | A0403 | T9206360 | | 1- |
| VR4001 | POT. | | | | RK0971111 20KA/SW | J60800254 | | 1- |
| VR4002 | POT. | 22k | | | RH03A3AJ4X 22K | J51807223 | | 1- |

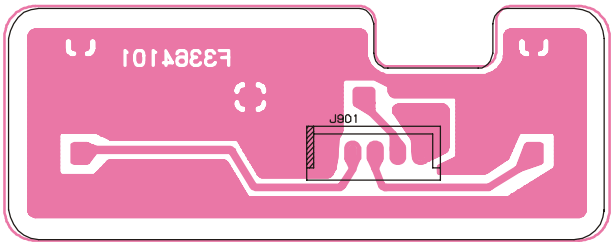
## PTT Uni Diagram




## PTT Unit Parts Layout




Side A

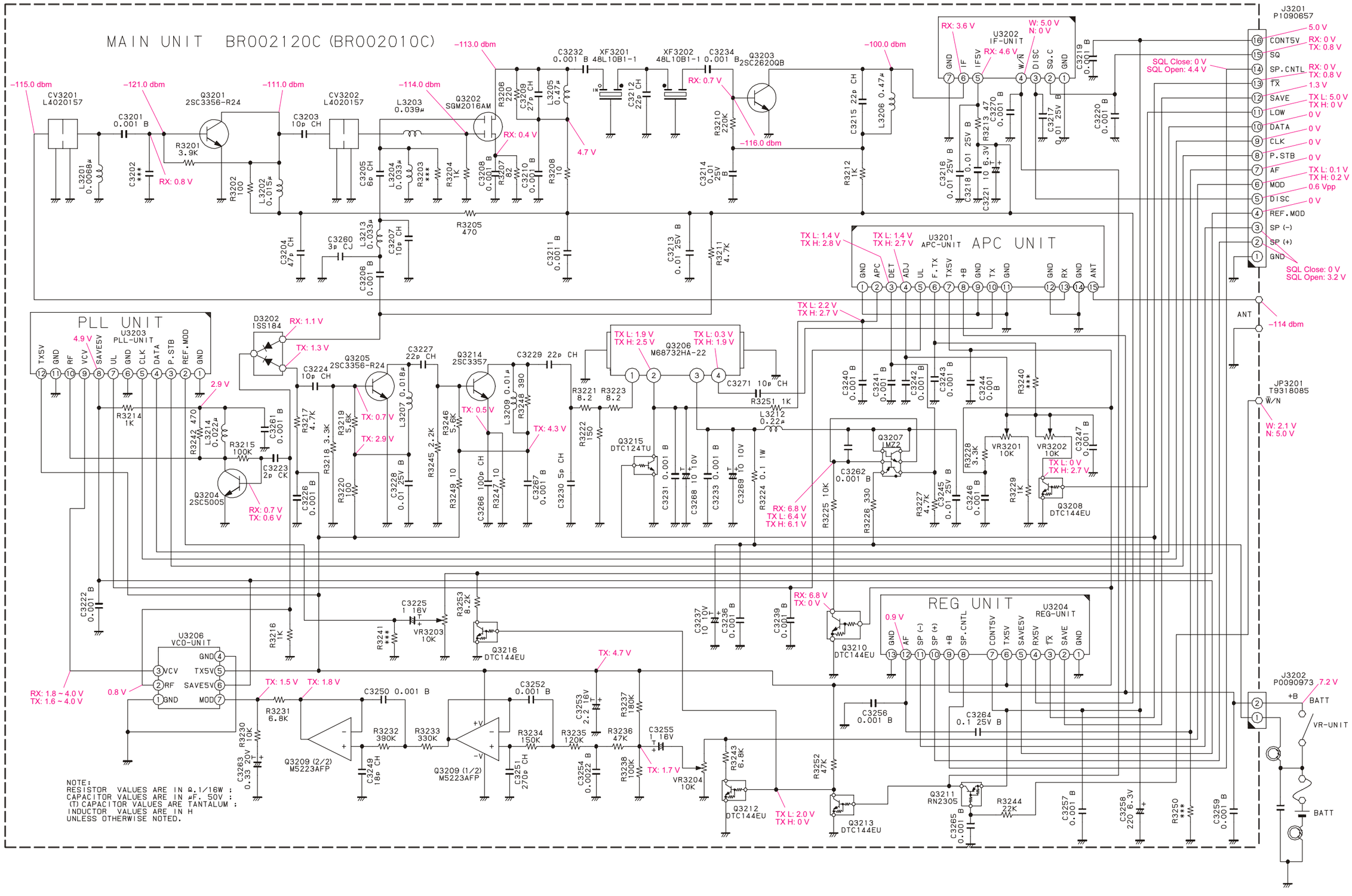



Side B

## Parts List

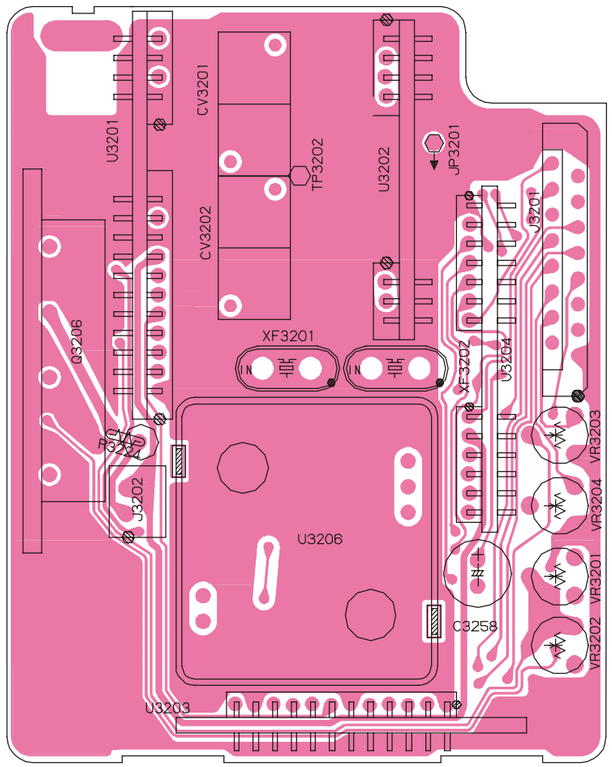
| | DESCRIPTION | VALUE | V/W | TOL. | MFR'S DESIG | VXSTD P/N | VERS. | LOT. |
|---|---|---|---|---|---|---|---|---|
| | PCB with Compornents | | | | | CB1469001 | | |
| | Printed Circuit Board | | | | | F3364101 | | 1- |
| J 4101 | CONNECTOR | | | | 9120B-05 | P0090955 | | 1- |
| S 4101 | TACT SWITCH | | | | SKQDAB | N5090058 | | 1- |
| S 4102 | TACT SWITCH | | | | SKQDAB | N5090058 | | 1- |
| S 4103 | TACT SWITCH | | | | SKQDAB | N5090058 | | 1- |

*Note:*

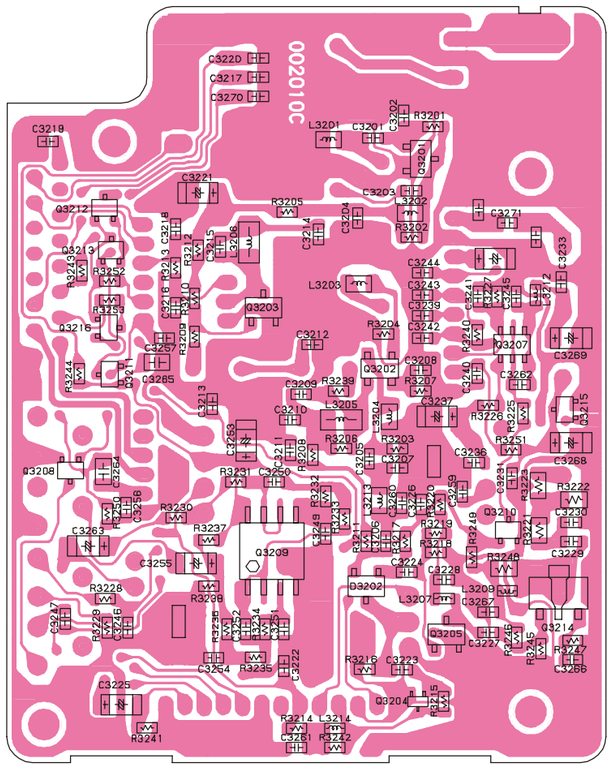

MAIN UNIT BR002120C (BR002010C)
PLL UNIT
U3203 PLL-UNIT
APC UNIT
U3201 APC-UNIT
REG UNIT
U3204 REG-UNIT
U3202 IF-UNIT
U3206 VCO-UNIT
J3201 P1090657
JP3201 T9318085
J3202 P0090973
CONT5V
SQ
SP.CNTL
TX
SAVE
LOW
DATA
CLK
P.STB
AF
MOD
DISC
REF.MOD
SP (-)
SP (+)
GND
ANT
BATT
VR-UNIT
W/N
–113.0 dbm
–115.0 dbm
–121.0 dbm
–111.0 dbm
–114.0 dbm
–100.0 dbm
–116.0 dbm
–114 dbm
RX: 0.4 V
RX: 0.7 V
RX: 0.8 V
RX: 3.6 V
RX: 4.6 V
RX: 1.1 V
RX: 6.8 V
RX: 0 V
RX: 1.8 ~ 4.0 V
TX: 1.3 V
TX: 0.7 V
TX: 2.9 V
TX: 0.5 V
TX: 4.3 V
TX: 0.6 V
TX: 1.5 V
TX: 1.8 V
TX: 4.7 V
TX: 1.7 V
TX L: 2.0 V
TX H: 0 V
TX L: 6.4 V
TX H: 6.1 V
TX L: 1.4 V
TX H: 2.8 V
TX L: 1.4 V
TX H: 2.7 V
TX L: 2.2 V
TX H: 2.7 V
TX L: 1.9 V
TX H: 2.5 V
TX L: 0.3 V
TX H: 1.9 V
TX L: 0 V
TX H: 2.7 V
TX L: 0.1 V
TX H: 0.2 V
W: 5.0 V
N: 0 V
W: 2.1 V
N: 5.0 V
SQL Close: 0 V
SQL Open: 4.4 V
SQL Close: 0 V
SQ Open: 3.2 V
5.0 V
0 V
1.3 V
0.6 Vpp
0.9 V
4.9 V
2.9 V
0.8 V
7.2 V
4.7 V
NOTE:
RESISTOR VALUES ARE IN Ω,1/16W :
CAPACITOR VALUES ARE IN μF, 50V :
(T) CAPACITOR VALUES ARE TANTALUM :
INDUCTOR VALUES ARE IN H
UNLESS OTHERWISE NOTED.

# *Main Unit*

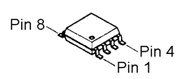
## *Parts Layout*



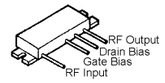

Side A



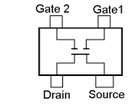

Side B



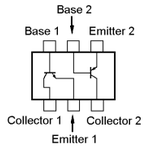

M5223FP
(Q3209)



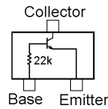

M68732HA
(Q3206)



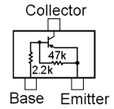

SGM2016AM (MA)
(Q3202)



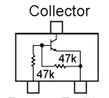

IMZ2 (Z2)
(Q3207)



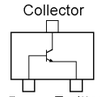

DTC124TU (05)
(Q3215)



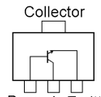

RN2305 (YE)
(Q3211)




DTC144EU (26)
(Q3208, 3210, 3212,
3213, 3216)




2SC3356 (R24)
(Q3201, 3205)
2SC2620 (QB)
(Q3203)
2SC5005 (73)
(Q3204)

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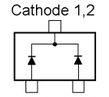
(Q3214)




1SS184 (B3)
(D3202)

## *Parts List*

| REF. | DESCRIPTION | VALUE | V/W | TOL. | MFR'S DESIG | VXSTD P/N | VERS. | LOT. | SIDE |
|---|---|---|---|---|---|---|---|---|---|
| | PCB with Compornents | | | | | CP7007001 | | | |
| | P.C.B. W/O COMP. | | | | | FR002020A | | 1 | |
| C 3201 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 3203 | CHIP CAP. | 10pF | 50V | CH | GRM39CH100D50PT | K22174211 | | 1- | B |
| C 3204 | CHIP CAP. | 47pF | 50V | CH | GRM39CH470J50PT | K22174227 | | 1- | B |
| C 3205 | CHIP CAP. | 6pF | 50V | CH | GRM39CH060D50PT | K22174207 | | 1- | B |
| C 3206 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 3207 | CHIP CAP. | 10pF | 50V | CH | GRM39CH100D50PT | K22174211 | | 1- | B |
| C 3208 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 3209 | CHIP CAP. | 27pF | 50V | CH | GRM39CH270J50PT | K22174221 | | 1- | B |
| C 3210 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 3211 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 3212 | CHIP CAP. | 22pF | 50V | CH | GRM39CH220J50PT | K22174219 | | 1- | B |
| C 3213 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | | 1- | B |
| C 3214 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | | 1- | B |
| C 3215 | CHIP CAP. | 22pF | 50V | CH | GRM39CH220J50PT | K22174219 | | 1- | B |
| C 3216 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | | 1- | B |
| C 3217 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | | 1- | B |
| C 3218 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | | 1- | B |
| C 3219 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 3220 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 3221 | CHIP TA.CAP. | 10uF | 6.3V | | TEMSVA0J106M-8R | K78080027 | | 1- | B |
| C 3222 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 3223 | CHIP CAP. | 2pF | 50V | CK | GRM39CK020C50PT | K22174203 | | 1- | B |
| C 3224 | CHIP CAP. | 10pF | 50V | CH | GRM39CH100D50PT | K22174211 | | 1- | B |
| C 3225 | CHIP TA.CAP. | 1uF | 16V | | TESVA1C105M1-8R | K78120009 | | 1- | B |
| C 3226 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 3227 | CHIP CAP. | 22pF | 50V | CH | GRM39CH220J50PT | K22174219 | | 1- | B |
| C 3228 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | | 1- | B |
| C 3229 | CHIP CAP. | 22pF | 50V | CH | GRM39CH220J50PT | K22174219 | | 1- | B |
| C 3230 | CHIP CAP. | 5pF | 50V | CH | GRM39CH050C50PT | K22174206 | | 1- | B |
| C 3231 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 3232 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 3233 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 3234 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 3236 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 3237 | CHIP TA.CAP. | 10uF | 10V | | TEMSVA1A106M-8R | K78100028 | | 1- | B |
| C 3239 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 3240 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 3241 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 3242 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 3243 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 3244 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 3245 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | | 1- | B |
| C 3246 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 3247 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 3249 | CHIP CAP. | 18pF | 50V | CH | GRM39CH180J50PT | K22174217 | | 1- | B |
| C 3250 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 3251 | CHIP CAP. | 270pF | 50V | CH | GRM39CH271J50PT | K22174251 | | 1- | B |
| C 3252 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 3253 | CHIP TA.CAP. | 2.2uF | 16V | | TEMSVA1C225M-8R | K78120015 | | 1- | B |
| C 3254 | CHIP CAP. | 0.0022uF | 50V | B | GRM39B222K50PT | K22174822 | | 1- | B |
| C 3254 | CHIP CAP. | 0.0018uF | 50V | B | GRM39B182K50PT | K22174828 | | 6- | B |
| C 3255 | CHIP TA.CAP. | 1uF | 16V | | TESVA1C105M1-8R | K78120009 | | 1- | B |
| C 3256 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 3257 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 3258 | AL.ELECTRO.CAP. | 220uF | 6.3V | | RE3-6V221M 220UF | K40089029 | | 1- | A |
| C 3259 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 3260 | CHIP CAP. | 3pF | 50V | CJ | GRM39CJ030C50PT | K22174204 | | 1- | B |
| C 3261 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |

# *MAIN Unit*

| REF. | DESCRIPTION | VALUE | V/W | TOL. | MFR'S DESIG | VXSTD P/N | VERS. | LOT. | SIDE |
|---|---|---|---|---|---|---|---|---|---|
| C 3262 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 3263 | CHIP TA.CAP. | 0.33uF | 20V | | TEMSVA21D334M-8R | K78130018 | | 1- | B |
| C 3264 | CHIP CAP. | 0.1uF | 25V | B | GRM40B104M25PT | K22140811 | | 1- | B |
| C 3265 | CHIP CAP. | 0.001uF | 50V | B | GRM40B102K50PT | K22170825 | | 1- | B |
| C 3266 | CHIP CAP. | 100pF | 50V | CH | GRM39CH101J50PT | K22174235 | | 1- | B |
| C 3267 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 3268 | CHIP TA.CAP. | 10uF | 10V | | TEMSVA1A106M-8R | K78100028 | | 1- | B |
| C 3269 | CHIP TA.CAP. | 10uF | 10V | | TEMSVA1A106M-8R | K78100028 | | 1- | B |
| C 3270 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 3271 | CHIP CAP. | 10pF | 50V | CH | GRM39CH100D50PT | K22174211 | | 1- | B |
| CV3201 | HELICAL RESONATOR | 460MHz | | | LH-0281 460M | L4020157 | | 1- | A |
| CV3202 | HELICAL RESONATOR | 460MHz | | | LH-0281 460M | L4020157 | | 1- | A |
| D 3202 | DIODE | | | | 1SS184 TE85R | G2070009 | | 1- | B |
| J 3201 | CONNECTOR | | | | 52030-1610 | P1090657 | | 1- | A |
| J 3202 | CONNECTOR | | | | IL-S-2P-S2T2-EF | P0090973 | | 1- | A |
| JP3201 | WIRE ASSY | | | | BRN 100 908061/(2) | T9318085 | | 1- | A |
| L 3201 | M.RFC | 0.0068uH | | | LL2012·F06N | L1690165 | | 1- | B |
| L 3202 | M.RFC | 0.015uH | | | LL2012·F15N | L1690168 | | 1- | B |
| L 3203 | M.RFC | 0.039uH | | | LL2012·F39N | L1690173 | | 1- | B |
| L 3204 | M.RFC | 0.033uH | | | LL2012·F33N | L1690172 | | 1- | B |
| L 3205 | CHIP COIL | 0.47uH | | | LQH1NR47M04 | L1690142 | | 1- | B |
| L 3206 | CHIP COIL | 0.47uH | | | LQH1NR47M04 | L1690142 | | 1- | B |
| L 3207 | M.RFC | 0.018uH | | | LL1608-F18NK | L1690362 | | 1- | B |
| L 3209 | M.RFC | 0.01uH | | | LL1608-F10NK | L1690359 | | 1- | B |
| L 3212 | M.RFC | 0.22uH | | | LK1608 R22K-T | L1690410 | | 1- | B |
| L 3213 | M.RFC | 0.033uH | | | LL2012·F33N | L1690172 | | 1- | B |
| L 3214 | M.RFC | 0.022uH | | | LL1608-F22NK | L1690363 | | 1- | B |
| Q 3201 | TRANSISTOR | | | | 2SC3356-T2B R24 | G3333567D | | 1- | B |
| Q 3202 | FET | | | | 3SK320(TE85L) | G4803208 | | 1- | B |
| Q 3203 | TRANSISTOR | | | | 2SC2620QBTR | G3326207B | | 1- | B |
| Q 3204 | TRANSISTOR | | | | 2SC5005-T1 | G3350058 | | 1- | B |
| Q 3205 | TRANSISTOR | | | | 2SC3356-T2B R24 | G3333567D | | 1- | B |
| Q 3206 | IC | | | | M68732HA-22 | G1092836 | | 1- | A |
| Q 3207 | TRANSISTOR | | | | IMZ2A T108 | G3070060 | | 1- | B |
| Q 3208 | TRANSISTOR | | | | DTC144EU T106 | G3070041 | | 1- | B |
| Q 3209 | IC | | | | M5223AFP 600C | G1092955 | | 1- | B |
| Q 3210 | TRANSISTOR | | | | DTC144EU T106 | G3070041 | | 1- | B |
| Q 3211 | TRANSISTOR | | | | RN2305 TE85R | G3070123 | | 1- | B |
| Q 3212 | TRANSISTOR | | | | DTC144EU T106 | G3070041 | | 1- | B |
| Q 3213 | TRANSISTOR | | | | DTC144EU T106 | G3070041 | | 1- | B |
| Q 3214 | TRANSISTOR | | | | 2SC3357-T2 | G3333577 | | 1- | B |
| Q 3215 | TRANSISTOR | | | | DTC124TU T106 | G3070065 | | 1- | B |
| Q 3216 | TRANSISTOR | | | | DTC144EU T106 | G3070041 | | 1- | B |
| R 3201 | CHIP RES. | 3.9k | 1/16W | 5% | RMC1/16 392JATP | J24185392 | | 1- | B |
| R 3202 | CHIP RES. | 100 | 1/16W | 5% | RMC1/16 101JATP | J24185101 | | 1- | B |
| R 3204 | CHIP RES. | 1k | 1/16W | 5% | RMC1/16 102JATP | J24185102 | | 1- | B |
| R 3205 | CHIP RES. | 470 | 1/16W | 5% | RMC1/16 471JATP | J24185471 | | 1- | B |
| R 3206 | CHIP RES. | 220 | 1/16W | 5% | RMC1/16 221JATP | J24185221 | | 1- | B |
| R 3207 | CHIP RES. | 82 | 1/16W | 5% | RMC1/16 820JATP | J24185820 | | 1- | B |
| R 3208 | CHIP RES. | 10 | 1/16W | 5% | RMC1/16 100JATP | J24185100 | | 1- | B |
| R 3210 | CHIP RES. | 220k | 1/16W | 5% | RMC1/16 224JATP | J24185224 | | 1- | B |
| R 3211 | CHIP RES. | 4.7k | 1/16W | 5% | RMC1/16 472JATP | J24185472 | | 1- | B |
| R 3212 | CHIP RES. | 1k | 1/16W | 5% | RMC1/16 102JATP | J24185102 | | 1- | B |
| R 3213 | CHIP RES. | 47 | 1/16W | 5% | RMC1/16 470JATP | J24185470 | | 1- | B |
| R 3214 | CHIP RES. | 1k | 1/16W | 5% | RMC1/16 102JATP | J24185102 | | 1- | B |
| R 3215 | CHIP RES. | 100k | 1/16W | 5% | RMC1/16 104JATP | J24185104 | | 1- | B |
| R 3216 | CHIP RES. | 1k | 1/16W | 5% | RMC1/16 102JATP | J24185102 | | 1- | B |
| R 3217 | CHIP RES. | 4.7k | 1/16W | 5% | RMC1/16 472JATP | J24185472 | | 1- | B |
| R 3218 | CHIP RES. | 3.3k | 1/16W | 5% | RMC1/16 332JATP | J24185332 | | 1- | B |
| R 3219 | CHIP RES. | 5.6k | 1/16W | 5% | RMC1/16 562JATP | J24185562 | | 1- | B |

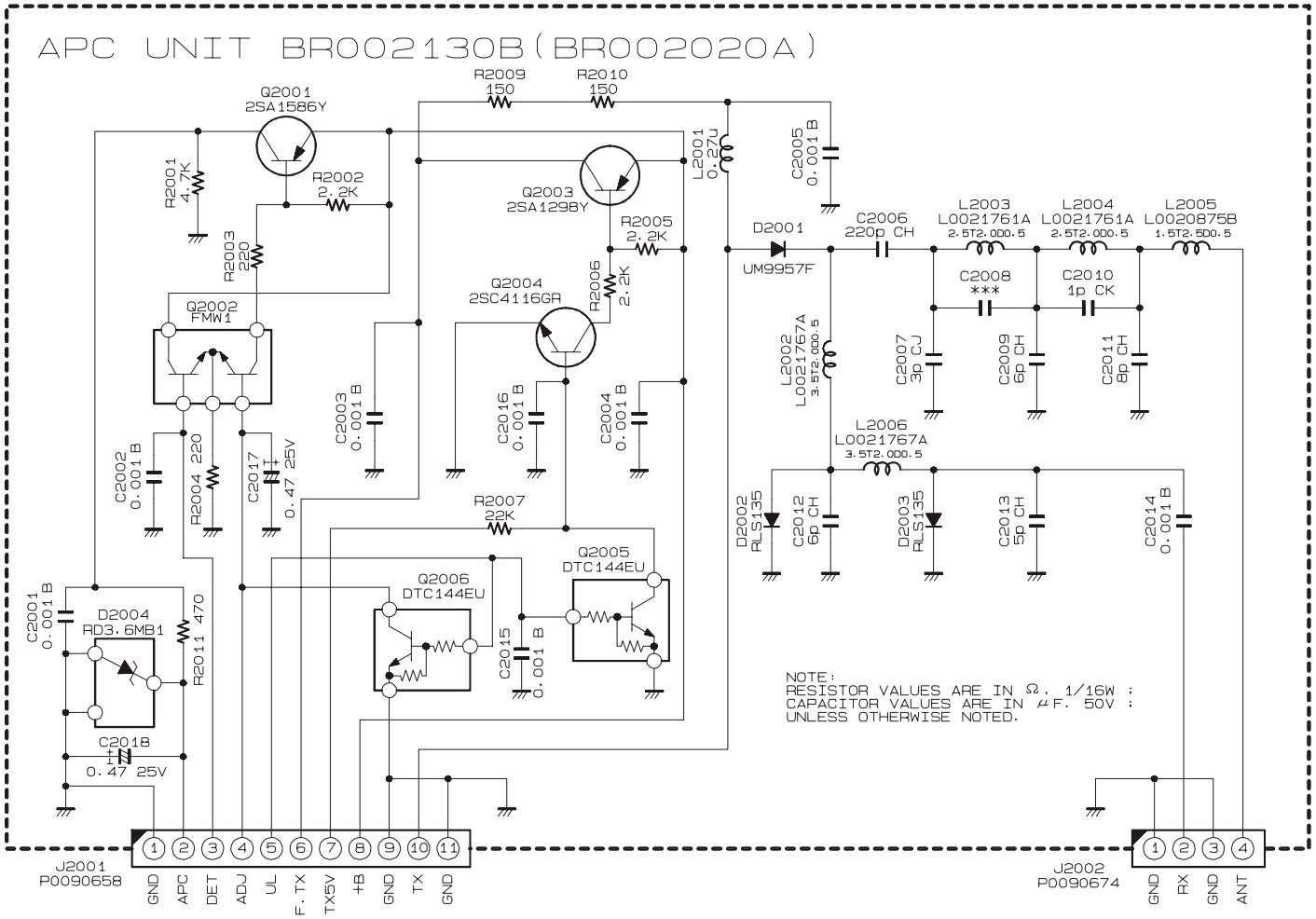
| REF. | DESCRIPTION | VALUE | V/W | TOL. | MFR'S DESIG | VXSTD P/N | VERS. | LOT. | SIDE |
|---|---|---|---|---|---|---|---|---|---|
| R 3220 | CHIP RES. | 100 | 1/16W | 5% | RMC1/16 101JATP | J24185101 | | 1- | B |
| R 3221 | CHIP RES. | 8.2 | 1/10W | 5% | RMC1/10T 8R2J | J24205829 | | 1- | B |
| R 3222 | CHIP RES. | 150 | 1/10W | 5% | RMC1/10T 151J | J24205151 | | 1- | B |
| R 3223 | CHIP RES. | 8.2 | 1/10W | 5% | RMC1/10T 8R2J | J24205829 | | 1- | B |
| R 3224 | METAL FILM RES. | 0.1 | 1W | 5% | ERX-1SZJR10 0.1 | J22309036 | | 1- | A |
| R 3225 | CHIP RES. | 10k | 1/16W | 5% | RMC1/16 103JATP | J24185103 | | 1- | B |
| R 3226 | CHIP RES. | 330 | 1/16W | 5% | RMC1/16 331JATP | J24185331 | | 1- | B |
| R 3227 | CHIP RES. | 4.7k | 1/16W | 5% | RMC1/16 472JATP | J24185472 | | 1- | B |
| R 3228 | CHIP RES. | 3.3k | 1/16W | 5% | RMC1/16 332JATP | J24185332 | | 1- | B |
| R 3229 | CHIP RES. | 1k | 1/16W | 5% | RMC1/16 102JATP | J24185102 | | 1- | B |
| R 3230 | CHIP RES. | 10k | 1/16W | 5% | RMC1/16 103JATP | J24185103 | | 1- | B |
| R 3230 | CHIP RES. | 10k | 1/16W | 1% | RMC1/16 103FTP | J24183103 | | 6- | B |
| R 3231 | CHIP RES. | 6.8k | 1/16W | 5% | RMC1/16 682JATP | J24185682 | | 1- | B |
| R 3231 | CHIP RES. | 6.8k | 1/16W | 1% | RMC1/16 682FTP | J24183682 | | 6- | B |
| R 3232 | CHIP RES. | 390k | 1/16W | 5% | RMC1/16 394JATP | J24185394 | | 1- | B |
| R 3232 | CHIP RES. | 390k | 1/16W | 1% | RMC1/16 394FTP | J24183394 | | 6- | B |
| R 3233 | CHIP RES. | 330k | 1/16W | 5% | RMC1/16 334JATP | J24185334 | | 1- | B |
| R 3233 | CHIP RES. | 330k | 1/16W | 1% | RMC1/16 334FTP | J24183334 | | 6- | B |
| R 3234 | CHIP RES. | 150k | 1/16W | 5% | RMC1/16 154JATP | J24185154 | | 1- | B |
| R 3234 | CHIP RES. | 150k | 1/16W | 1% | RMC1/16 154FTP | J24183154 | | 6- | B |
| R 3235 | CHIP RES. | 120k | 1/16W | 5% | RMC1/16 124JATP | J24185124 | | 1- | B |
| R 3235 | CHIP RES. | 120k | 1/16W | 1% | RMC1/16 124FTP | J24183124 | | 6- | B |
| R 3236 | CHIP RES. | 47k | 1/16W | 5% | RMC1/16 473JATP | J24185473 | | 1- | B |
| R 3236 | CHIP RES. | 47k | 1/16W | 1% | RMC1/16 473FTP | J24183473 | | 6- | B |
| R 3237 | CHIP RES. | 180k | 1/16W | 5% | RMC1/16 184JATP | J24185184 | | 1- | B |
| R 3238 | CHIP RES. | 100k | 1/16W | 5% | RMC1/16 104JATP | J24185104 | | 1- | B |
| R 3242 | CHIP RES. | 470 | 1/16W | 5% | RMC1/16 471JATP | J24185471 | | 1- | B |
| R 3243 | CHIP RES. | 5.6k | 1/16W | 5% | RMC1/16 562JATP | J24185562 | | 1- | B |
| R 3243 | CHIP RES. | 6.2k | 1/16W | 1% | RMC1/16 622FTP | J24183622 | | 4- | B |
| R 3244 | CHIP RES. | 22k | 1/16W | 5% | RMC1/16 223JATP | J24185223 | | 1- | B |
| R 3245 | CHIP RES. | 2.2k | 1/16W | 5% | RMC1/16 222JATP | J24185222 | | 1- | B |
| R 3246 | CHIP RES. | 5.6k | 1/16W | 5% | RMC1/16 562JATP | J24185562 | | 1- | B |
| R 3247 | CHIP RES. | 10 | 1/16W | 5% | RMC1/16 100JATP | J24185100 | | 1- | B |
| R 3248 | CHIP RES. | 390 | 1/10W | 5% | RMC1/10T 391J | J24205391 | | 1- | B |
| R 3249 | CHIP RES. | 10 | 1/16W | 5% | RMC1/16 100JATP | J24185100 | | 1- | B |
| R 3251 | CHIP RES. | 1k | 1/16W | 5% | RMC1/16 102JATP | J24185102 | | 1- | B |
| R 3252 | CHIP RES. | 47k | 1/16W | 5% | RMC1/16 473JATP | J24185473 | | 1- | B |
| R 3253 | CHIP RES. | 8.2k | 1/16W | 5% | RMC1/16 822JATP | J24185822 | | 1- | B |
| VR3201 | POT. | 10k | | | RH0411C14J 10K | J51776103 | | 1- | A |
| VR3202 | POT. | 10k | | | RH0411C14J 10K | J51776103 | | 1- | A |
| VR3203 | POT. | 10k | | | RH0411C14J 10K | J51776103 | | 1- | A |
| VR3204 | POT. | 10k | | | RH0411C14J 10K | J51776103 | | 1- | A |
| XF3201 | XTAL FILTER | | | | 48L10B1-1 | H1102179 | | 1- | A |
| XF3202 | XTAL FILTER | | | | 48L10B1-1 | H1102179 | | 1- | A |
| | LEAF SPRING | | | | | R0145950 | | 1- | |
| | LEAF SPRING | | | | | R0145960 | | 1- | |
| | LEAF SPRING | | | | | R0149980 | | 1- | |
| | SHIELD CASE | | | | | RA0074400 | | 1- | |
| | HEATSINK PLATE | | | | | RA0074300 | | 1- | |

## *MAIN Unit*

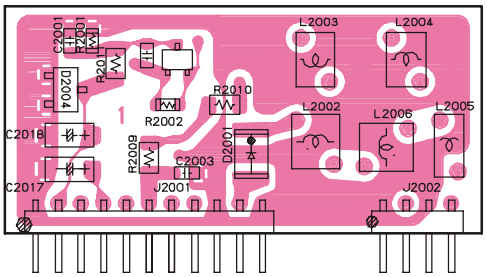
***Note:***

# APC Unit

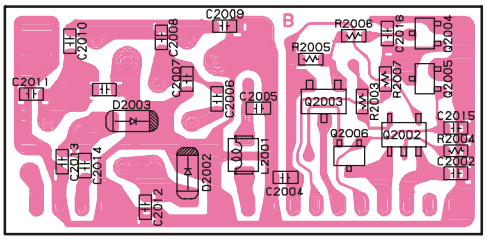
## Circuit Diagram



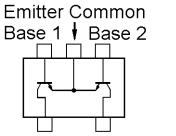

## Parts Layout



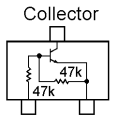
Side A



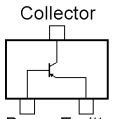
Side B



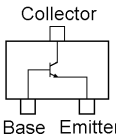

FMW1 (W1)
(Q2002)



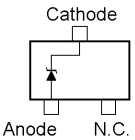

DTC144EU (26)
(Q2005, 2006)




2SA1586Y (SY)
(Q2001)
2SA1298Y (IY)
(Q2003)




2SC4116GR (LG)
(Q2004)



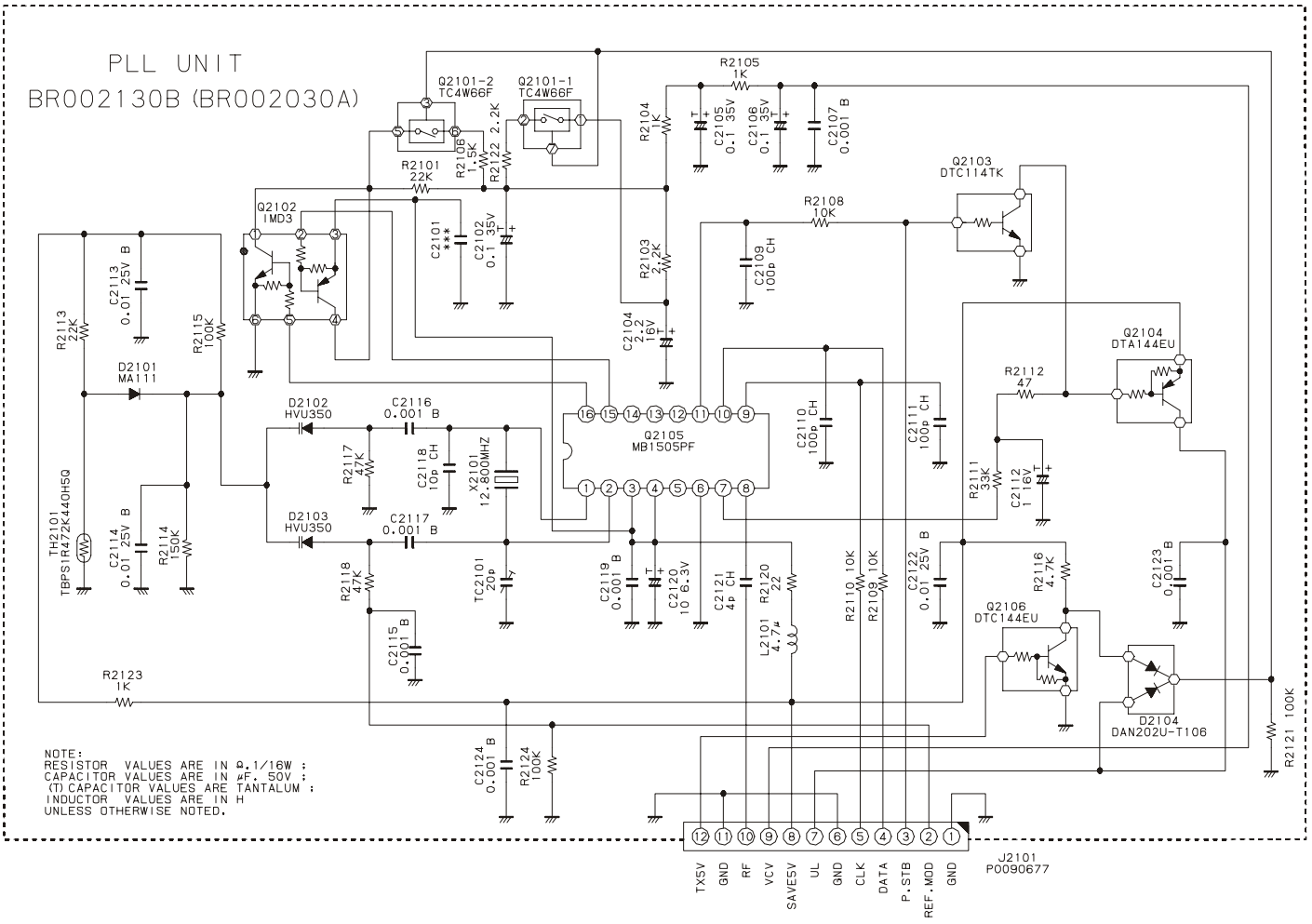

RD3.6MB1 (361)
(D2004)

# *APC Unit*

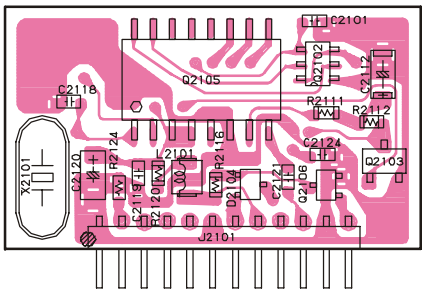
## *Parts List*

| REF. | DESCRIPTION | VALUE | V/W | TOL. | MFR'S DESIG | VXSTD P/N | VERS. | LOT. | SIDE |
|---|---|---|---|---|---|---|---|---|---|
| | PCB with Components | | | | | CB1462001 | | | |
| | P.C.B. W/O COMP. | | | | | FR002020A | | 1 | |
| C 2001 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 2002 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 2003 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 2004 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 2005 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 2006 | CHIP CAP. | 220pF | 50V | CH | GRM39CH221J50PT | K22174243 | | 1- | B |
| C 2007 | CHIP CAP. | 3pF | 50V | CJ | GRM39CJ030C50PT | K22174204 | | 1- | B |
| C 2009 | CHIP CAP. | 6pF | 50V | CH | GRM39CH060D50PT | K22174207 | | 1- | B |
| C 2010 | CHIP CAP. | 1pF | 50V | CK | GRM39CK010C50PT | K22174202 | | 1- | B |
| C 2011 | CHIP CAP. | 8pF | 50V | CH | GRM39CH080D50PT | K22174209 | | 1- | B |
| C 2012 | CHIP CAP. | 6pF | 50V | CH | GRM39CH060D50PT | K22174207 | | 1- | B |
| C 2013 | CHIP CAP. | 5pF | 50V | CH | GRM39CH050C50PT | K22174206 | | 1- | B |
| C 2014 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 2015 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 2016 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 2017 | CHIP TA.CAP. | 0.47uF | 25V | | TESVA1E474M1-8R | K78140009 | | 1- | A |
| C 2018 | CHIP TA.CAP. | 0.47uF | 25V | | TESVA1E474M1-8R | K78140009 | | 1- | A |
| D 2001 | DIODE | | | | UM9957F/TR | G2070562 | | 1- | A |
| D 2002 | DIODE | | | | RLS135 TE-11 | G2070128 | | 1- | B |
| D 2003 | DIODE | | | | RLS135 TE-11 | G2070128 | | 1- | B |
| D 2004 | DIODE | | | | RD3.6MB1-T1B | G2070392 | | 1- | A |
| J 2001 | CONNECTOR | | | | 9230B-1-11Z009-T | P0090658 | | 1- | A |
| J 2002 | CONNECTOR | | | | 9230B-1-04Z009-T | P0090674 | | 1- | A |
| L 2001 | M.RFC | 0.27uH | | | ELJ-FCR27MF | L1690341 | | 1- | B |
| L 2002 | COIL A1 | | | | 3.5T2.0D0.5UEW R | L0021767A | | 1- | A |
| L 2003 | COIL A1 | | | | 2.5T2.0D0.5UEW R | L0021761A | | 1- | A |
| L 2004 | COIL A1 | | | | 2.5T2.0D0.5UEW R | L0021761A | | 1- | A |
| L 2005 | COIL A1 | | | | 1.5T2.5D0.5UEW R | L0020875B | | 1- | A |
| L 2006 | COIL A1 | | | | 3.5T2.0D0.5UEW R | L0021767A | | 1- | A |
| Q 2001 | TRANSISTOR | | | | 2SA1586Y TE85R | G3115867Y | | 1- | A |
| Q 2002 | TRANSISTOR | | | | FMW1 T98 | G3070009 | | 1- | B |
| Q 2003 | TRANSISTOR | | | | 2SA1298Y TE85R | G3112987Y | | 1- | B |
| Q 2004 | TRANSISTOR | | | | 2SC4116GR TE85R | G3341167G | | 1- | B |
| Q 2005 | TRANSISTOR | | | | DTC144EU T106 | G3070041 | | 1- | B |
| Q 2006 | TRANSISTOR | | | | DTC144EU T106 | G3070041 | | 1- | B |
| R 2001 | CHIP RES. | 4.7k | 1/16W | 5% | RMC1/16 472JATP | J24185472 | | 1- | A |
| R 2002 | CHIP RES. | 2.2k | 1/16W | 5% | RMC1/16 222JATP | J24185222 | | 1- | A |
| R 2003 | CHIP RES. | 220 | 1/16W | 5% | RMC1/16 221JATP | J24185221 | | 1- | B |
| R 2004 | CHIP RES. | 220 | 1/16W | 5% | RMC1/16 221JATP | J24185221 | | 1- | B |
| R 2005 | CHIP RES. | 2.2k | 1/16W | 5% | RMC1/16 222JATP | J24185222 | | 1- | B |
| R 2006 | CHIP RES. | 2.2k | 1/16W | 5% | RMC1/16 222JATP | J24185222 | | 1- | B |
| R 2007 | CHIP RES. | 22k | 1/16W | 5% | RMC1/16 223JATP | J24185223 | | 1- | B |
| R 2009 | CHIP RES. | 150 | 1/10W | 5% | RMC1/10T 151J | J24205151 | | 1- | A |
| R 2010 | CHIP RES. | 150 | 1/10W | 5% | RMC1/10T 151J | J24205151 | | 1- | A |
| R 2011 | CHIP RES. | 470 | 1/10W | 5% | RMC1/10T 471J | J24205471 | | 1- | A |
| | SHIELD CASE | | | | S-5LD | L9190067 | | 1- | |
| | SHIELD CASE | | | | S-5LD | L9190067 | | 1- | |

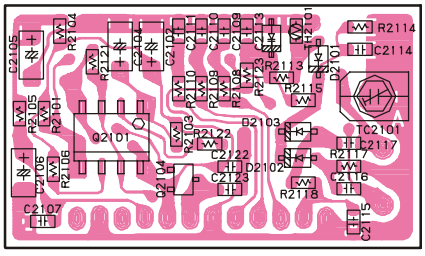
## Circuit Diagram



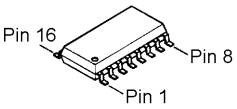

## Parts Layout



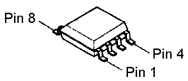
Side A



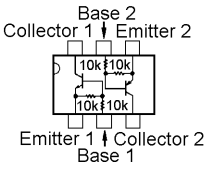
Side B



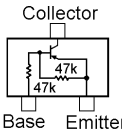

MB1505PF
(Q2105)



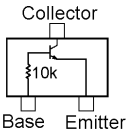

TC4W66F
(Q2101)



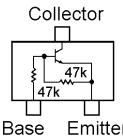

IMD3 (D3)
(Q2102)



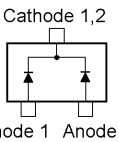

DTA144EU (16)
(Q2104)




DTC114TK (04)
(Q2103)




DTC144EU (26)
(Q2106)




DAN202U (N)
(D2104)

# *PLL Unit*

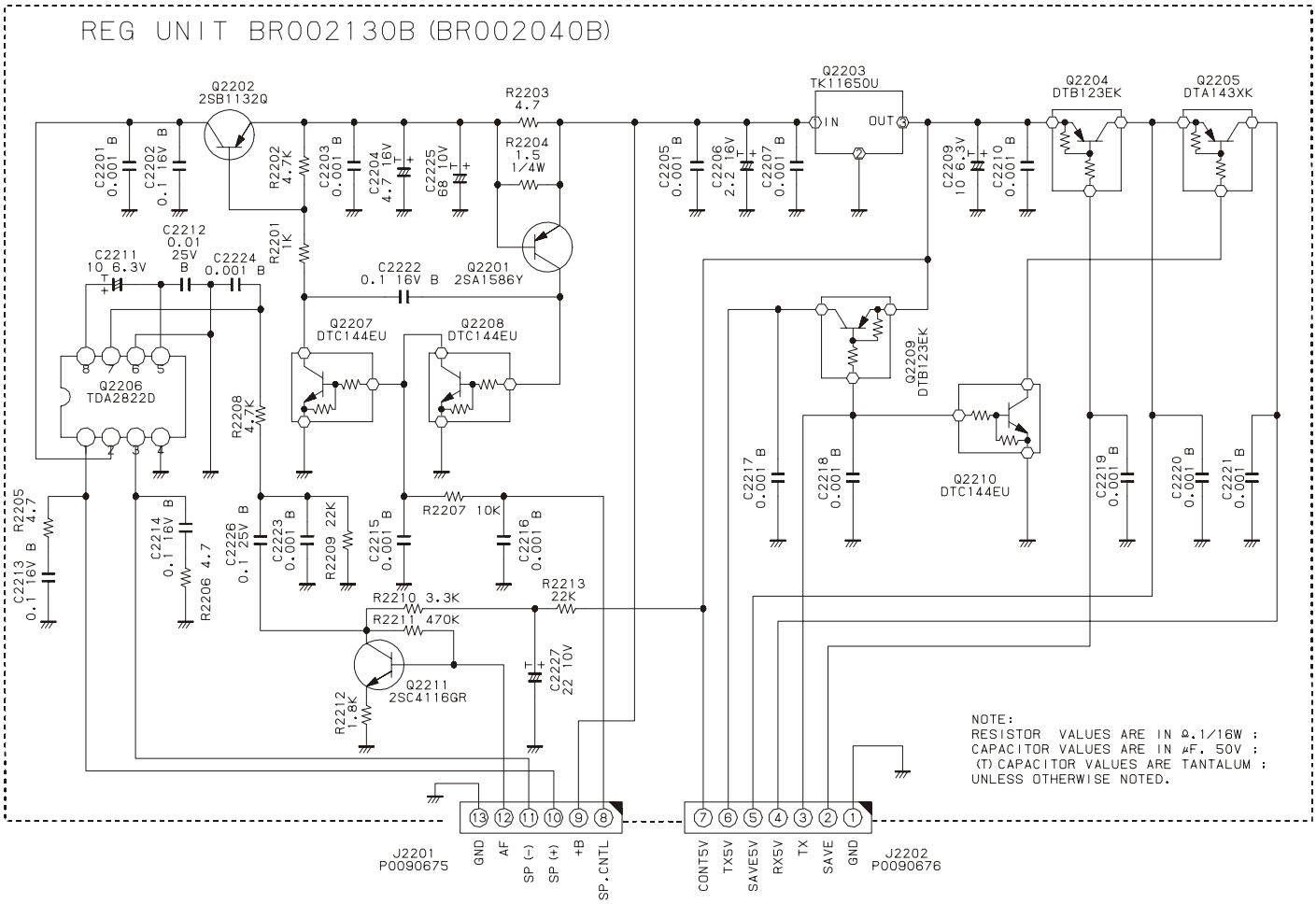
## *Parts List*

| REF. | DESCRIPTION | VALUE | V/W | TOL. | MFR'S DESIG | VXSTD P/N | VERS. | LOT. | SIDE |
|---|---|---|---|---|---|---|---|---|---|
| | PCB with Components | | | | | CB1463001 | TCO OFF | | |
| | P.C.B. W/O COMP. | | | | | FR002030A | | 1 | |
| C 2102 | CHIP TA.CAP. | 0.1uF | 35V | | TESVA1V104M1-8R | K78160025 | | 1-2 | B |
| C 2102 | CHIP TA.CAP. | 0.1uF | 35V | | TESVA1V104M1-8R | K78160025 | W/O TCXO | 3- | B |
| C 2104 | CHIP TA.CAP. | 2.2uF | 16V | | TEMSVA1C225M-8R | K78120015 | | 1-2 | B |
| C 2104 | CHIP TA.CAP. | 2.2uF | 16V | | TEMSVA1C225M-8R | K78120015 | W/O TCXO | 3- | B |
| C 2105 | CHIP TA.CAP. | 0.1uF | 35V | | TESVA1V104M1-8R | K78160025 | | 1-2 | B |
| C 2105 | CHIP TA.CAP. | 0.1uF | 35V | | TESVA1V104M1-8R | K78160025 | W/O TCXO | 3- | B |
| C 2106 | CHIP TA.CAP. | 0.1uF | 35V | | TESVA1V104M1-8R | K78160025 | | 1-2 | B |
| C 2106 | CHIP TA.CAP. | 0.1uF | 35V | | TESVA1V104M1-8R | K78160025 | W/O TCXO | 3- | B |
| C 2107 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1-2 | B |
| C 2107 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | W/O TCXO | 3- | B |
| C 2109 | CHIP CAP. | 100pF | 50V | CH | GRM39CH101J50PT | K22174235 | | 1-2 | B |
| C 2109 | CHIP CAP. | 100pF | 50V | CH | GRM39CH101J50PT | K22174235 | W/O TCXO | 3- | B |
| C 2110 | CHIP CAP. | 100pF | 50V | CH | GRM39CH101J50PT | K22174235 | | 1-2 | B |
| C 2110 | CHIP CAP. | 100pF | 50V | CH | GRM39CH101J50PT | K22174235 | W/O TCXO | 3- | B |
| C 2111 | CHIP CAP. | 100pF | 50V | CH | GRM39CH101J50PT | K22174235 | | 1-2 | B |
| C 2111 | CHIP CAP. | 100pF | 50V | CH | GRM39CH101J50PT | K22174235 | W/O TCXO | 3- | B |
| C 2112 | CHIP TA.CAP. | 1uF | 16V | | TESVA1C105M1-8R | K78120009 | | 1-2 | A |
| C 2112 | CHIP TA.CAP. | 1uF | 16V | | TESVA1C105M1-8R | K78120009 | W/O TCXO | 3- | A |
| C 2113 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | | 1-2 | B |
| C 2113 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | W/O TCXO | 3- | B |
| C 2114 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | | 1-2 | B |
| C 2114 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | W/O TCXO | 3- | B |
| C 2115 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1-2 | B |
| C 2115 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | W/O TCXO | 3- | B |
| C 2116 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1-2 | B |
| C 2116 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | W/O TCXO | 3- | B |
| C 2117 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1-2 | B |
| C 2117 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | W/O TCXO | 3- | B |
| C 2118 | CHIP CAP. | 10pF | 50V | CH | GRM39CH100D50PT | K22174211 | | 1-2 | A |
| C 2118 | CHIP CAP. | 22pF | 50V | CH | GRM39CH220J50PT | K22174219 | W/O TCXO | 3- | A |
| C 2119 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1-2 | A |
| C 2119 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | W/O TCXO | 3- | A |
| C 2120 | CHIP TA.CAP. | 10uF | 6.3V | | TEMSVA0J106M-8R | K78080027 | | 1-2 | A |
| C 2120 | CHIP TA.CAP. | 10uF | 6.3V | | TEMSVA0J106M-8R | K78080027 | W/O TCXO | 3- | A |
| C 2121 | CHIP CAP. | 4pF | 50V | CH | GRM39CH040C50PT | K22174205 | | 1-2 | A |
| C 2121 | CHIP CAP. | 4pF | 50V | CH | GRM39CH040C50PT | K22174205 | W/O TCXO | 3- | A |
| C 2122 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | | 1-2 | B |
| C 2122 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | W/O TCXO | 3- | B |
| C 2123 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1-2 | B |
| C 2123 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | W/O TCXO | 3- | B |
| C 2124 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1-2 | A |
| C 2124 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | W/O TCXO | 3- | A |
| D 2101 | DIODE | | | | MA111-(TX) | G2070338 | | 1-2 | B |
| D 2101 | DIODE | | | | MA111-(TX) | G2070338 | W/O TCXO | 3- | B |
| D 2102 | DIODE | | | | HVU350TRF | G2070380 | | 1-2 | B |
| D 2102 | DIODE | | | | HVU350TRF | G2070380 | W/O TCXO | 3- | B |
| D 2103 | DIODE | | | | HVU350TRF | G2070380 | | 1-2 | B |
| D 2103 | DIODE | | | | HVU350TRF | G2070380 | W/O TCXO | 3- | B |
| D 2104 | DIODE | | | | DAN202U T106 | G2070162 | | 1-2 | A |
| D 2104 | DIODE | | | | DAN202U T106 | G2070162 | W/O TCXO | 3- | A |
| J 2101 | CONNECTOR | | | | 9230B-1-12Z009-T | P0090677 | | 1-2 | A |
| J 2101 | CONNECTOR | | | | 9230B-1-12Z009-T | P0090677 | W/O TCXO | 3- | A |
| L 2101 | M.RFC | 4.7uH | | | ELJ-FC4R7KF | L1690348 | | 1-2 | A |
| L 2101 | M.RFC | 4.7uH | | | ELJ-FC4R7KF | L1690348 | W/O TCXO | 3- | A |
| Q 2101 | IC | | | | TC4W66F TE12L | G1091493 | | 1-2 | B |
| Q 2101 | IC | | | | TC4W66F TE12L | G1091493 | W/O TCXO | 3- | B |
| Q 2102 | TRANSISTOR | | | | IMD3 T108 | G3070053 | | 1-2 | A |
| Q 2102 | TRANSISTOR | | | | IMD3 T108 | G3070053 | W/O TCXO | 3- | A |

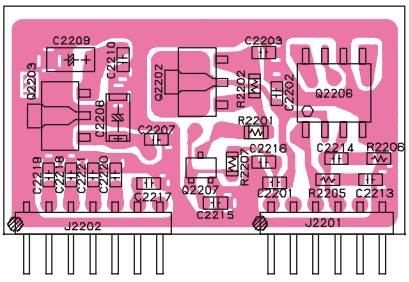
| REF. | DESCRIPTION | VALUE | V/W | TOL. | MFR'S DESIG | VXSTD P/N | VERS. | LOT. | SIDE |
|---|---|---|---|---|---|---|---|---|---|
| Q 2103 | TRANSISTOR | | | | DTC114TK T146 | G3070073 | | 1-2 | A |
| Q 2103 | TRANSISTOR | | | | DTC114TK T146 | G3070073 | W/O TCXO | 3- | A |
| Q 2104 | TRANSISTOR | | | | DTA144EU T106 | G3070079 | | 1-2 | B |
| Q 2104 | TRANSISTOR | | | | DTA144EU T106 | G3070079 | W/O TCXO | 3- | B |
| Q 2105 | IC | | | | MB1505PF-G-BND-TF | G1091706 | | 1-2 | A |
| Q 2105 | IC | | | | MB1505PF-G-BND-TF | G1091706 | W/O TCXO | 3- | A |
| Q 2106 | TRANSISTOR | | | | DTC144EU T106 | G3070041 | | 1-2 | A |
| Q 2106 | TRANSISTOR | | | | DTC144EU T106 | G3070041 | W/O TCXO | 3- | A |
| R 2101 | CHIP RES. | 22k | 1/16W | 5% | RMC1/16 223JATP | J24185223 | | 1-2 | B |
| R 2101 | CHIP RES. | 22k | 1/16W | 5% | RMC1/16 223JATP | J24185223 | W/O TCXO | 3- | B |
| R 2103 | CHIP RES. | 2.2k | 1/16W | 5% | RMC1/16 222JATP | J24185222 | | 1-2 | B |
| R 2103 | CHIP RES. | 2.2k | 1/16W | 5% | RMC1/16 222JATP | J24185222 | W/O TCXO | 3- | B |
| R 2104 | CHIP RES. | 1k | 1/16W | 5% | RMC1/16 102JATP | J24185102 | | 1-2 | B |
| R 2104 | CHIP RES. | 1k | 1/16W | 5% | RMC1/16 102JATP | J24185102 | W/O TCXO | 3- | B |
| R 2105 | CHIP RES. | 1k | 1/16W | 5% | RMC1/16 102JATP | J24185102 | | 1-2 | B |
| R 2105 | CHIP RES. | 1k | 1/16W | 5% | RMC1/16 102JATP | J24185102 | W/O TCXO | 3- | B |
| R 2106 | CHIP RES. | 1.5k | 1/16W | 5% | RMC1/16 152JATP | J24185152 | | 1-2 | B |
| R 2106 | CHIP RES. | 1.5k | 1/16W | 5% | RMC1/16 152JATP | J24185152 | W/O TCXO | 3- | B |
| R 2108 | CHIP RES. | 10k | 1/16W | 5% | RMC1/16 103JATP | J24185103 | | 1-2 | B |
| R 2108 | CHIP RES. | 10k | 1/16W | 5% | RMC1/16 103JATP | J24185103 | W/O TCXO | 3- | B |
| R 2109 | CHIP RES. | 10k | 1/16W | 5% | RMC1/16 103JATP | J24185103 | | 1-2 | B |
| R 2109 | CHIP RES. | 10k | 1/16W | 5% | RMC1/16 103JATP | J24185103 | W/O TCXO | 3- | B |
| R 2110 | CHIP RES. | 10k | 1/16W | 5% | RMC1/16 103JATP | J24185103 | | 1-2 | B |
| R 2110 | CHIP RES. | 10k | 1/16W | 5% | RMC1/16 103JATP | J24185103 | W/O TCXO | 3- | B |
| R 2111 | CHIP RES. | 33k | 1/16W | 5% | RMC1/16 333JATP | J24185333 | | 1-2 | A |
| R 2111 | CHIP RES. | 33k | 1/16W | 5% | RMC1/16 333JATP | J24185333 | W/O TCXO | 3- | A |
| R 2112 | CHIP RES. | 47 | 1/16W | 5% | RMC1/16 470JATP | J24185470 | | 1-2 | A |
| R 2112 | CHIP RES. | 47 | 1/16W | 5% | RMC1/16 470JATP | J24185470 | W/O TCXO | 3- | A |
| R 2113 | CHIP RES. | 22k | 1/16W | 5% | RMC1/16 223JATP | J24185223 | | 1-2 | B |
| R 2113 | CHIP RES. | 22k | 1/16W | 5% | RMC1/16 223JATP | J24185223 | W/O TCXO | 3- | B |
| R 2114 | CHIP RES. | 150k | 1/16W | 5% | RMC1/16 154JATP | J24185154 | | 1-2 | B |
| R 2114 | CHIP RES. | 150k | 1/16W | 5% | RMC1/16 154JATP | J24185154 | W/O TCXO | 3- | B |
| R 2115 | CHIP RES. | 100k | 1/16W | 5% | RMC1/16 104JATP | J24185104 | | 1-2 | B |
| R 2115 | CHIP RES. | 100k | 1/16W | 5% | RMC1/16 104JATP | J24185104 | W/O TCXO | 3- | B |
| R 2116 | CHIP RES. | 4.7k | 1/16W | 5% | RMC1/16 472JATP | J24185472 | | 1-2 | A |
| R 2116 | CHIP RES. | 4.7k | 1/16W | 5% | RMC1/16 472JATP | J24185472 | W/O TCXO | 3- | A |
| R 2117 | CHIP RES. | 47k | 1/16W | 5% | RMC1/16 473JATP | J24185473 | | 1-2 | B |
| R 2117 | CHIP RES. | 47k | 1/16W | 5% | RMC1/16 473JATP | J24185473 | W/O TCXO | 3- | B |
| R 2118 | CHIP RES. | 47k | 1/16W | 5% | RMC1/16 473JATP | J24185473 | | 1-2 | B |
| R 2118 | CHIP RES. | 47k | 1/16W | 5% | RMC1/16 473JATP | J24185473 | W/O TCXO | 3- | B |
| R 2120 | CHIP RES. | 22 | 1/16W | 5% | RMC1/16 220JATP | J24185220 | | 1-2 | A |
| R 2120 | CHIP RES. | 22 | 1/16W | 5% | RMC1/16 220JATP | J24185220 | W/O TCXO | 3- | A |
| R 2121 | CHIP RES. | 100k | 1/16W | 5% | RMC1/16 104JATP | J24185104 | | 1-2 | B |
| R 2121 | CHIP RES. | 100k | 1/16W | 5% | RMC1/16 104JATP | J24185104 | W/O TCXO | 3- | B |
| R 2122 | CHIP RES. | 2.2k | 1/16W | 5% | RMC1/16 222JATP | J24185222 | | 1-2 | B |
| R 2122 | CHIP RES. | 2.2k | 1/16W | 5% | RMC1/16 222JATP | J24185222 | W/O TCXO | 3- | B |
| R 2123 | CHIP RES. | 1k | 1/16W | 5% | RMC1/16 102JATP | J24185102 | | 1-2 | B |
| R 2123 | CHIP RES. | 1k | 1/16W | 5% | RMC1/16 102JATP | J24185102 | W/O TCXO | 3- | B |
| R 2124 | CHIP RES. | 100k | 1/16W | 5% | RMC1/16 104JATP | J24185104 | | 1-2 | A |
| R 2124 | CHIP RES. | 100k | 1/16W | 5% | RMC1/16 104JATP | J24185104 | W/O TCXO | 3- | A |
| TC2101 | TRIMMER CAP. | 20pF | | | ECR-KN020E61X | K91000213 | | 1-2 | B |
| TC2101 | TRIMMER CAP. | 10pF | | | ECR-KN010C61X | K91000226 | W/O TCXO | 3- | B |
| TH2101 | THERMISTOR | | | | TBPS1R472K440H5Q | G9090066 | | 1-2 | B |
| TH2101 | THERMISTOR | | | | TBPS1R472K440H5Q | G9090066 | W/O TCXO | 3- | B |
| X 2101 | XTAL UM-5 | 12.8MHz | | | 12.800MHZ | H0103192 | | 1-2 | A |
| X 2101 | XTAL UM-5 | 12.8MHz | | | 12.800MHZ | H0103192 | W/O TCXO | 3- | A |

# REG Unit

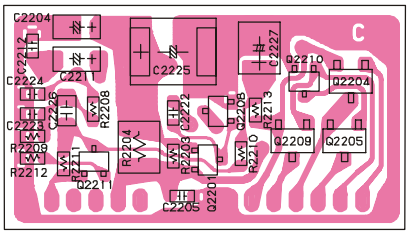
## Circuit Diagram



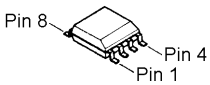

## Parts Layout



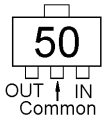
Side A



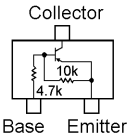
Side B



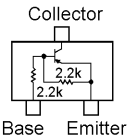

TDA2822D
(Q2206)



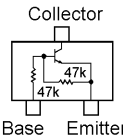

TK11650UTL (50)
(Q2203)



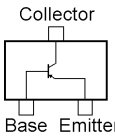

DTA143XK (33)
(Q2205)



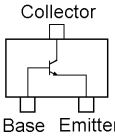

DTB123EK (F12)
(Q2204, 2209)



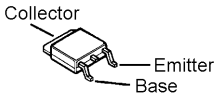

DTC144EU (26)
(Q2207, 2208, 2210)




2SA1586Y (SY)
(Q2201)




2SC4116GR (LG)
(Q2211)



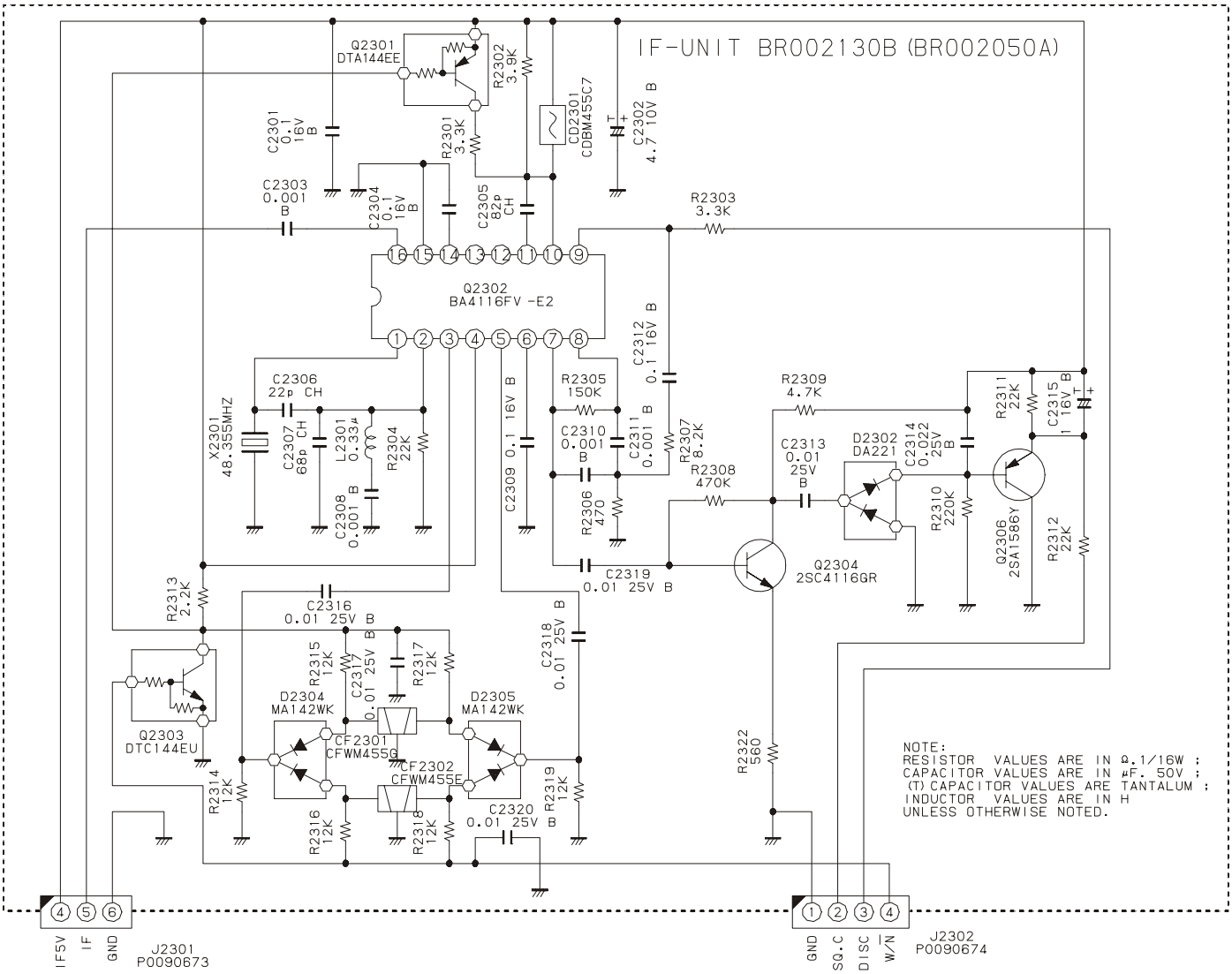

2SB1132Q (BA)
(Q2202)

## *Parts List*

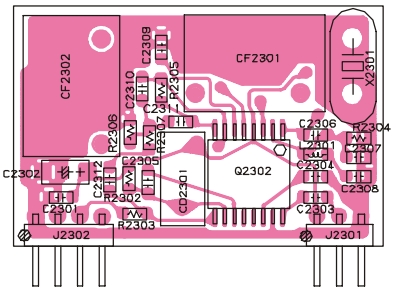
| REF. | DESCRIPTION | VALUE | V/W | TOL. | MFR'S DESIG | VXSTD P/N | VERS. | LOT. | SIDE |
|---|---|---|---|---|---|---|---|---|---|
| | PCB with Compornents | | | | | CB1464001 | | | |
| | P.C.B. W/O COMP. | | | | | FR002040B | | 1 | |
| C 2201 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 2202 | CHIP CAP. | 0.1uF | 16V | B | GRM39B104K16PT | K22124805 | | 1- | A |
| C 2203 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 2204 | CHIP TA.CAP. | 4.7uF | 16V | | TEMSVA1C475M-8R | K78120031 | | 1- | B |
| C 2205 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 2206 | CHIP TA.CAP. | 2.2uF | 16V | | TEMSVA1C225M-8R | K78120015 | | 1- | A |
| C 2207 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 2209 | CHIP TA.CAP. | 10uF | 6.3V | | TEMSVA0J106M-8R | K78080027 | | 1- | A |
| C 2210 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 2211 | CHIP TA.CAP. | 10uF | 6.3V | | TEMSVA0J106M-8R | K78080027 | | 1- | B |
| C 2212 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | | 1- | B |
| C 2213 | CHIP CAP. | 0.1uF | 16V | B | GRM39B104K16PT | K22124805 | | 1- | A |
| C 2214 | CHIP CAP. | 0.1uF | 16V | B | GRM39B104K16PT | K22124805 | | 1- | A |
| C 2215 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 2216 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 2217 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 2218 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 2219 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 2220 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 2221 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 2222 | CHIP CAP. | 0.1uF | 16V | B | GRM39B104K16PT | K22124805 | | 1- | B |
| C 2223 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 2224 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 2225 | CHIP TA.CAP. | 68uF | 10V | | TEMSVD21A686M12R | K78100030 | | 1- | B |
| C 2226 | CHIP CAP. | 0.1uF | 25V | B | GRM40B104M25PT | K22140811 | | 1- | B |
| C 2227 | CHIP TA.CAP. | 22uF | 10V | | TEMSVB21A226M-8R | K78100029 | | 1- | B |
| J 2201 | CONNECTOR | | | | 9230B-1-06Z009-T | P0090675 | | 1- | A |
| J 2202 | CONNECTOR | | | | 9230B-1-07Z009-T | P0090676 | | 1- | A |
| Q 2201 | TRANSISTOR | | | | 2SA1586Y TE85R | G3115867Y | | 1- | B |
| Q 2202 | TRANSISTOR | | | | 2SB1132 T100 Q | G3211327Q | | 1- | A |
| Q 2203 | IC | | | | TK11650UTL | G1091663 | | 1- | A |
| Q 2204 | TRANSISTOR | | | | DTB123EK T146 | G3070022 | | 1- | B |
| Q 2205 | TRANSISTOR | | | | DTA143XK T146 | G3070032 | | 1- | B |
| Q 2206 | IC | | | | TDA2822D013TR | G1091542 | | 1- | A |
| Q 2207 | TRANSISTOR | | | | DTC144EU T106 | G3070041 | | 1- | A |
| Q 2208 | TRANSISTOR | | | | DTC144EU T106 | G3070041 | | 1- | B |
| Q 2209 | TRANSISTOR | | | | DTB123EK T146 | G3070022 | | 1- | B |
| Q 2210 | TRANSISTOR | | | | DTC144EU T106 | G3070041 | | 1- | B |
| Q 2211 | TRANSISTOR | | | | 2SC4116GR TE85R | G3341167G | | 1- | B |
| R 2201 | CHIP RES. | 1k | 1/16W | 5% | RMC1/16 102JATP | J24185102 | | 1- | A |
| R 2202 | CHIP RES. | 4.7k | 1/16W | 5% | RMC1/16 472JATP | J24185472 | | 1- | A |
| R 2203 | CHIP RES. | 4.7 | 1/16W | 5% | RMC1/16 4R7JATP | J24185479 | | 1- | B |
| R 2204 | CHIP RES. | 1.5 | 1/4W | 5% | RMC1/4 1R5JATP | J24245159 | | 1- | B |
| R 2205 | CHIP RES. | 4.7 | 1/16W | 5% | RMC1/16 4R7JATP | J24185479 | | 1- | A |
| R 2206 | CHIP RES. | 4.7 | 1/16W | 5% | RMC1/16 4R7JATP | J24185479 | | 1- | A |
| R 2207 | CHIP RES. | 10k | 1/16W | 5% | RMC1/16 103JATP | J24185103 | | 1- | A |
| R 2208 | CHIP RES. | 4.7k | 1/16W | 5% | RMC1/16 472JATP | J24185472 | | 1- | B |
| R 2209 | CHIP RES. | 22k | 1/16W | 5% | RMC1/16 223JATP | J24185223 | | 1- | A |
| R 2210 | CHIP RES. | 3.3k | 1/16W | 5% | RMC1/16 332JATP | J24185332 | | 1- | B |
| R 2211 | CHIP RES. | 470k | 1/16W | 5% | RMC1/16 474JATP | J24185474 | | 1- | B |
| R 2212 | CHIP RES. | 1.8k | 1/16W | 5% | RMC1/16 182JATP | J24185182 | | 1- | B |
| R 2213 | CHIP RES. | 22k | 1/16W | 5% | RMC1/16 223JATP | J24185223 | | 1- | B |

# IF Unit

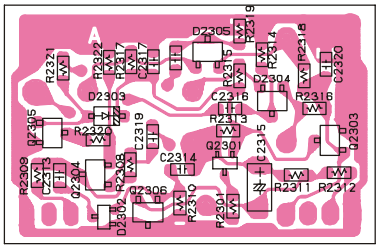
## Circuit Diagram



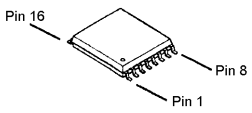

## Parts Layout



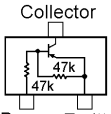

Side A



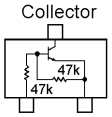

Side B



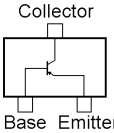

BA4116FV
(Q2302)



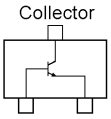

DTA144EE (16)
(Q2301)



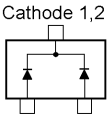

DTC144EU (26)
(Q2303)



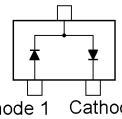

2SA1586Y (SY)
(Q2306)




2SC4116GR (LG)
(Q2304)




MA142WK (MU)
(D2304, 2305)



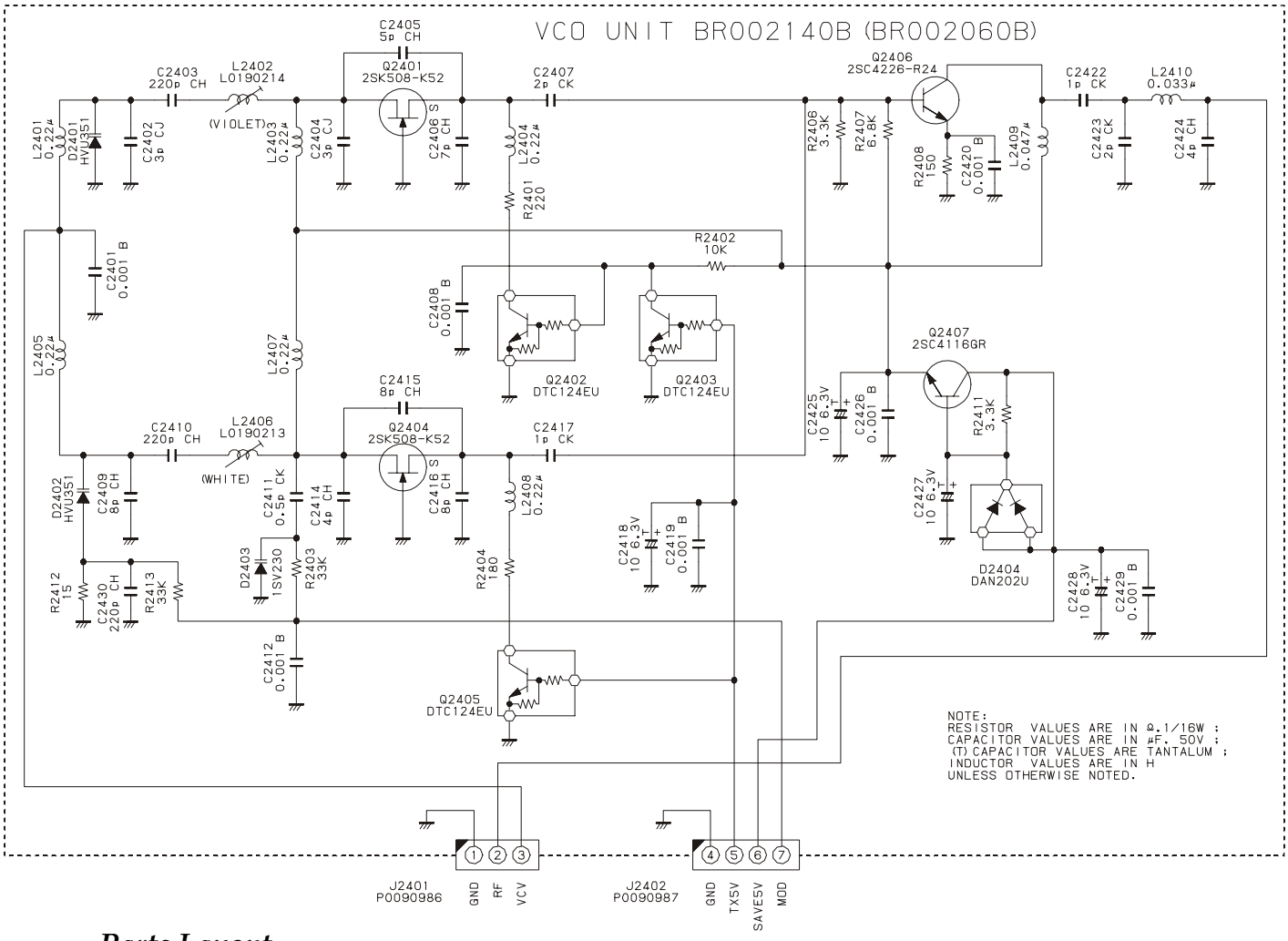

DA221 (K)
(D2302)

## Parts List

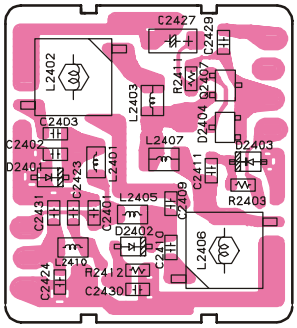
| REF. | DESCRIPTION | VALUE | V/W | TOL. | MFR'S DESIG | VXSTD P/N | VERS. | LOT. | SIDE |
|---|---|---|---|---|---|---|---|---|---|
| | PCB with Compornents | | | | | CB1465001 | | | |
| | P.C.B. W/O COMP. | | | | | FR002050A | | 1 | |
| C 2301 | CHIP CAP. | 0.1uF | 16V | B | GRM39B104K16PT | K22124805 | | 1- | A |
| C 2302 | CHIP TA.CAP. | 4.7uF | 10V | | TEMSVA1A475M-8R | K78100022 | | 1- | A |
| C 2303 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 2304 | CHIP CAP. | 0.1uF | 16V | B | GRM39B104K16PT | K22124805 | | 1- | A |
| C 2305 | CHIP CAP. | 82pF | 50V | CH | GRM39CH820J50PT | K22174233 | | 1- | A |
| C 2306 | CHIP CAP. | 22pF | 50V | CH | GRM39CH220J50PT | K22174219 | | 1- | A |
| C 2307 | CHIP CAP. | 68pF | 50V | CH | GRM39CH680J50PT | K22174231 | | 1- | A |
| C 2308 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 2309 | CHIP CAP. | 0.1uF | 16V | B | GRM39B104K16PT | K22124805 | | 1- | A |
| C 2310 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 2311 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 2312 | CHIP CAP. | 0.1uF | 16V | B | GRM39B104K16PT | K22124805 | | 1- | A |
| C 2313 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | | 1- | B |
| C 2314 | CHIP CAP. | 0.022uF | 25V | B | GRM39B223K25PT | K22144807 | | 1- | B |
| C 2315 | CHIP TA.CAP. | 1uF | 16V | | TESVA1C105M1-8R | K78120009 | | 1- | B |
| C 2316 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | | 1- | B |
| C 2317 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | | 1- | B |
| C 2318 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | | 1- | B |
| C 2319 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | | 1- | B |
| C 2320 | CHIP CAP. | 0.01uF | 25V | B | GRM39B103K25PT | K22144803 | | 1- | B |
| CD2301 | CERAMIC DISC | | | | CDBM455C7 | H7900480 | | 1- | A |
| CF2301 | CERAMIC FILTER | | | | CFWM455G | H3900399 | | 1- | A |
| CF2302 | CERAMIC FILTER | | | | CFWM455E | H3900400 | | 1- | A |
| D 2302 | DIODE | | | | DA221 TL | G2070178 | | 1- | B |
| D 2304 | DIODE | | | | MA142WK-(TX) | G2070534 | | 1- | B |
| D 2305 | DIODE | | | | MA142WK-(TX) | G2070534 | | 1- | B |
| J 2301 | CONNECTOR | | | | 9230B-1-03Z009-T | P0090673 | | 1- | A |
| J 2302 | CONNECTOR | | | | 9230B-1-04Z009-T | P0090674 | | 1- | A |
| L 2301 | M.RFC | 0.33uH | | | LK1608 R33K-T | L1690412 | | 1- | B |
| Q 2301 | TRANSISTOR | | | | DTA144EE TL | G3070074 | | 1- | B |
| Q 2302 | IC | | | | BA4116FV-E2 | G1092616 | | 1- | A |
| Q 2303 | TRANSISTOR | | | | DTC144EU T106 | G3070041 | | 1- | B |
| Q 2304 | TRANSISTOR | | | | 2SC4116GR TE85R | G3341167G | | 1- | B |
| Q 2306 | TRANSISTOR | | | | 2SA1586Y TE85R | G3115867Y | | 1- | B |
| R 2301 | CHIP RES. | 3.3k | 1/16W | 5% | RMC1/16 332JATP | J24185332 | | 1- | B |
| R 2302 | CHIP RES. | 3.9k | 1/16W | 5% | RMC1/16 392JATP | J24185392 | | 1- | A |
| R 2303 | CHIP RES. | 3.3k | 1/16W | 5% | RMC1/16 332JATP | J24185332 | | 1- | A |
| R 2304 | CHIP RES. | 22k | 1/16W | 5% | RMC1/16 223JATP | J24185223 | | 1- | A |
| R 2305 | CHIP RES. | 150k | 1/16W | 5% | RMC1/16 154JATP | J24185154 | | 1- | A |
| R 2306 | CHIP RES. | 470 | 1/16W | 5% | RMC1/16 471JATP | J24185471 | | 1- | A |
| R 2307 | CHIP RES. | 8.2k | 1/16W | 5% | RMC1/16 822JATP | J24185822 | | 1- | A |
| R 2308 | CHIP RES. | 470k | 1/16W | 5% | RMC1/16 474JATP | J24185474 | | 1- | B |
| R 2309 | CHIP RES. | 4.7k | 1/16W | 5% | RMC1/16 472JATP | J24185472 | | 1- | B |
| R 2310 | CHIP RES. | 220k | 1/16W | 5% | RMC1/16 224JATP | J24185224 | | 1- | B |
| R 2311 | CHIP RES. | 22k | 1/16W | 5% | RMC1/16 223JATP | J24185223 | | 1- | B |
| R 2312 | CHIP RES. | 22k | 1/16W | 5% | RMC1/16 223JATP | J24185223 | | 1- | B |
| R 2313 | CHIP RES. | 2.2k | 1/16W | 5% | RMC1/16 222JATP | J24185222 | | 1- | B |
| R 2314 | CHIP RES. | 12k | 1/16W | 5% | RMC1/16 123JATP | J24185123 | | 1- | B |
| R 2315 | CHIP RES. | 12k | 1/16W | 5% | RMC1/16 123JATP | J24185123 | | 1- | B |
| R 2316 | CHIP RES. | 12k | 1/16W | 5% | RMC1/16 123JATP | J24185123 | | 1- | B |
| R 2317 | CHIP RES. | 12k | 1/16W | 5% | RMC1/16 123JATP | J24185123 | | 1- | B |
| R 2318 | CHIP RES. | 12k | 1/16W | 5% | RMC1/16 123JATP | J24185123 | | 1- | B |
| R 2319 | CHIP RES. | 12k | 1/16W | 5% | RMC1/16 123JATP | J24185123 | | 1- | B |
| R 2322 | CHIP RES. | 560 | 1/16W | 5% | RMC1/16 561JATP | J24185561 | | 1- | B |
| X 2301 | XTAL UM-5 | 48.355MHz | | | 48.355MHZ | H0103087 | | 1- | A |

# VCO Unit

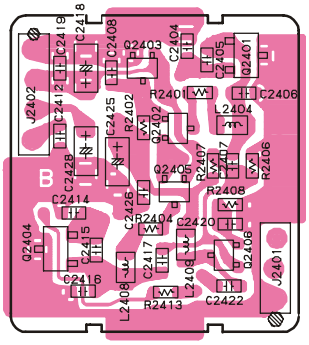
## Circuit Diagram



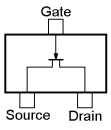

## Parts Layout



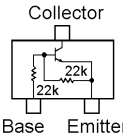
Side A



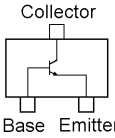
Side B



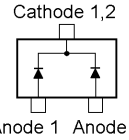

2SK508 (K52)
(Q2401, 2404)




DTC124EU (25)
(Q2402, 2403, 2405)




2SC4116GR (LG)
(Q2407)
2SC4226 (R24)
(Q2406)




DAN202U (N)
(D2404)

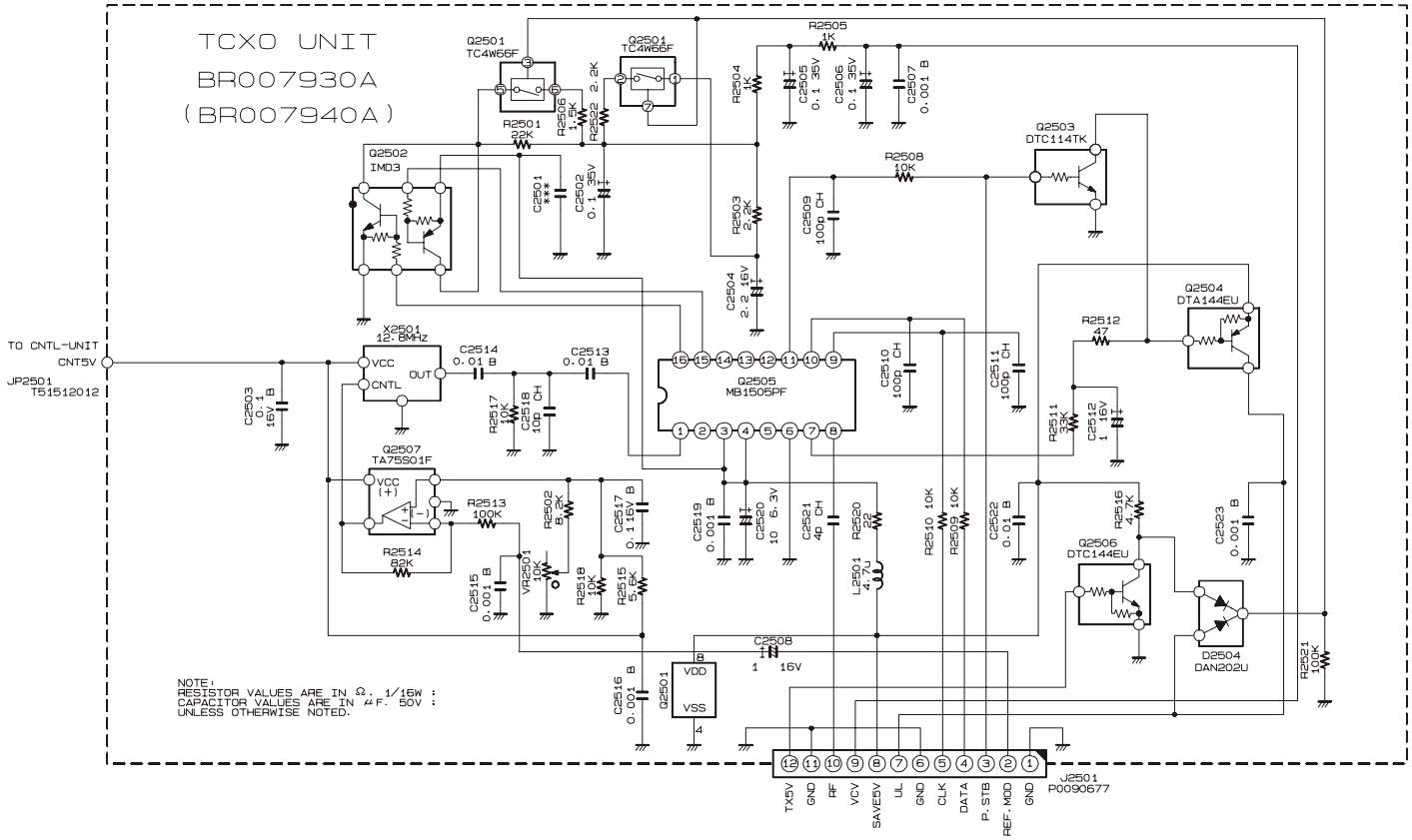
## Parts List

| REF. | DESCRIPTION | VALUE | V/W | TOL. | MFR'S DESIG | VXSTD P/N | VERS. | LOT. | SIDE |
|---|---|---|---|---|---|---|---|---|---|
| | PCB with Compornents | | | | | CB1466001 | | | |
| | P.C.B. W/O COMP. | | | | | FR002060B | | 1 | |
| C 2401 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | |
| C 2402 | CHIP CAP. | 3pF | 50V | CJ | GRM39CJ030C50PT | K22174204 | | 1- | |
| C 2403 | CHIP CAP. | 220pF | 50V | CH | GRM39CH221J50PT | K22174243 | | 1- | |
| C 2404 | CHIP CAP. | 3pF | 50V | CJ | GRM39CJ030C50PT | K22174204 | | 1- | |
| C 2405 | CHIP CAP. | 5pF | 50V | CH | GRM39CH050C50PT | K22174206 | | 1- | |
| C 2406 | CHIP CAP. | 7pF | 50V | CH | GRM39CH070D50PT | K22174208 | | 1- | |

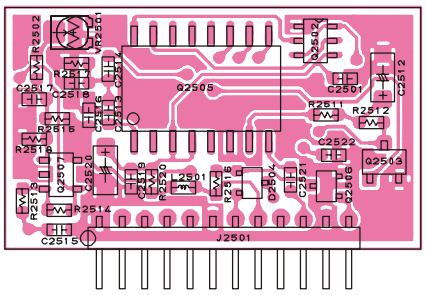
| REF. | DESCRIPTION | VALUE | V/W | TOL. | MFR'S DESIG | VXSTD P/N | VERS. | LOT. | SIDE |
|---|---|---|---|---|---|---|---|---|---|
| C 2407 | CHIP CAP. | 2pF | 50V | CK | GRM39CK020C50PT | K22174203 | | 1- | |
| C 2408 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | |
| C 2409 | CHIP CAP. | 8pF | 50V | CH | GRM39CH080D50PT | K22174209 | | 1- | |
| C 2410 | CHIP CAP. | 220pF | 50V | CH | GRM39CH221J50PT | K22174243 | | 1- | |
| C 2411 | CHIP CAP. | 0.5pF | 50V | CK | GRM39CK0R5C50PT | K22174201 | | 1- | |
| C 2412 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | |
| C 2414 | CHIP CAP. | 4pF | 50V | CH | GRM39CH040C50PT | K22174205 | | 1- | |
| C 2415 | CHIP CAP. | 8pF | 50V | CH | GRM39CH080D50PT | K22174209 | | 1- | |
| C 2416 | CHIP CAP. | 8pF | 50V | CH | GRM39CH080D50PT | K22174209 | | 1- | |
| C 2417 | CHIP CAP. | 1pF | 50V | CK | GRM39CK010C50PT | K22174202 | | 1- | |
| C 2418 | CHIP TA.CAP. | 10uF | 6.3V | | TEMSVA0J106M-8R | K78080027 | | 1- | |
| C 2419 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | |
| C 2420 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | |
| C 2422 | CHIP CAP. | 1pF | 50V | CK | GRM39CK010C50PT | K22174202 | | 1- | |
| C 2423 | CHIP CAP. | 2pF | 50V | CK | GRM39CK020C50PT | K22174203 | | 1- | |
| C 2424 | CHIP CAP. | 4pF | 50V | CH | GRM39CH040C50PT | K22174205 | | 1- | |
| C 2425 | CHIP TA.CAP. | 10uF | 6.3V | | TEMSVA0J106M-8R | K78080027 | | 1- | |
| C 2426 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | |
| C 2427 | CHIP TA.CAP. | 10uF | 6.3V | | TEMSVA0J106M-8R | K78080027 | | 1- | |
| C 2428 | CHIP TA.CAP. | 10uF | 6.3V | | TEMSVA0J106M-8R | K78080027 | | 1- | |
| C 2429 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | |
| C 2430 | CHIP CAP. | 220pF | 50V | CH | GRM39CH221J50PT | K22174243 | | 1- | |
| D 2401 | DIODE | | | | HVU351TRF | G2070304 | | 1- | |
| D 2402 | DIODE | | | | HVU351TRF | G2070304 | | 1- | |
| D 2403 | DIODE | | | | 1SV230 TPH3 | G2070126 | | 1- | |
| D 2404 | DIODE | | | | DAN202U T106 | G2070162 | | 1- | |
| J 2401 | CONNECTOR | | | | 9210B-1-03Z361-T | P0090986 | | 1- | |
| J 2402 | CONNECTOR | | | | 9210B-1-04Z361-T | P0090987 | | 1- | |
| L 2401 | M.RFC | 0.22uH | | | ELJ-NDR22JF | L1690628 | | 1- | |
| L 2402 | COIL | | | | E558AN-100041=P3 | L0190214 | | 1- | |
| L 2403 | CHIP COIL | 0.22uH | | | LQN21AR22J04 | L1690600 | | 1- | |
| L 2404 | M.RFC | 0.22uH | | | ELJ-NDR22JF | L1690628 | | 1- | |
| L 2405 | M.RFC | 0.22uH | | | ELJ-NDR22JF | L1690628 | | 1- | |
| L 2406 | COIL | | | | E558AN-100040=P3 | L0190213 | | 1- | |
| L 2407 | CHIP COIL | 0.22uH | | | LQN21AR22J04 | L1690600 | | 1- | |
| L 2408 | M.RFC | 0.22uH | | | ELJ-NDR22JF | L1690628 | | 1- | |
| L 2409 | M.RFC | 0.047uH | | | LL2012-F47N | L1690174 | | 1- | |
| L 2410 | M.RFC | 0.033uH | | | LL2012-F33N | L1690172 | | 1- | |
| Q 2401 | FET | | | | 2SK508-T2B K52 | G3805087B | | 1- | |
| Q 2402 | TRANSISTOR | | | | DTC124EU T106 | G3070045 | | 1- | |
| Q 2403 | TRANSISTOR | | | | DTC124EU T106 | G3070045 | | 1- | |
| Q 2404 | FET | | | | 2SK508-T2B K52 | G3805087B | | 1- | |
| Q 2405 | TRANSISTOR | | | | DTC124EU T106 | G3070045 | | 1- | |
| Q 2406 | TRANSISTOR | | | | 2SC4226-T2B R24 | G3342267D | | 1- | |
| Q 2407 | TRANSISTOR | | | | 2SC4116GR TE85R | G3341167G | | 1- | |
| R 2401 | CHIP RES. | 220 | 1/16W | 5% | RMC1/16 221JATP | J24185221 | | 1- | |
| R 2402 | CHIP RES. | 10k | 1/16W | 5% | RMC1/16 103JATP | J24185103 | | 1- | |
| R 2403 | CHIP RES. | 33k | 1/16W | 5% | RMC1/16 333JATP | J24185333 | | 1- | |
| R 2404 | CHIP RES. | 180 | 1/16W | 5% | RMC1/16 181JATP | J24185181 | | 1- | |
| R 2406 | CHIP RES. | 3.3k | 1/16W | 5% | RMC1/16 332JATP | J24185332 | | 1- | |
| R 2407 | CHIP RES. | 6.8k | 1/16W | 5% | RMC1/16 682JATP | J24185682 | | 1- | |
| R 2408 | CHIP RES. | 150 | 1/16W | 5% | RMC1/16 151JATP | J24185151 | | 1- | |
| R 2411 | CHIP RES. | 3.3k | 1/16W | 5% | RMC1/16 332JATP | J24185332 | | 1- | |
| R 2412 | CHIP RES. | 15 | 1/16W | 5% | RMC1/16 150JATP | J24185150 | | 1- | |
| R 2413 | CHIP RES. | 33k | 1/16W | 5% | RMC1/16 333JATP | J24185333 | | 1- | |
| | SHIELD CASE | | | | | R0145830 | | 1- | |
| | SHIELD PLATE | | | | | R0150300 | | 1- | |

# TCXO Unit

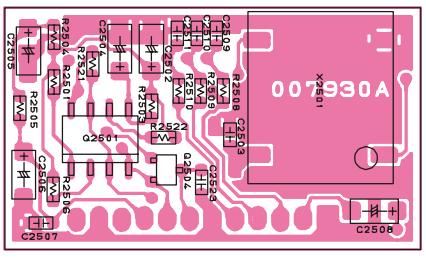
## Circuit Diagram



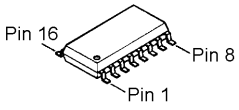

## Parts Layout



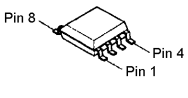
Side A



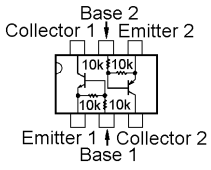
Side B



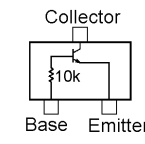

MB1505PF
(Q2505)



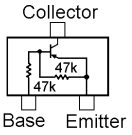

TC4W66F
(Q2501)



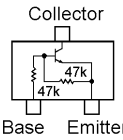

IMD3 (D3)
(Q2502)




DTC114TK (04)
(Q2503)




DTA144EU (16)
(Q2504)




DTC144EU (26)
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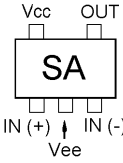
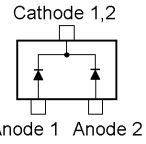



TA75S01F (SA)
(Q2507)




DAN202U (N)
(D2504)

## *Parts List*

| REF. | DESCRIPTION | VALUE | V/W | TOL. | MFR'S DESIG | VXSTD P/N | VERS. | LOT. | SIDE |
|---|---|---|---|---|---|---|---|---|---|
| | PCB with Compornents | | | | | CB1897001 | TCO ON | | |
| | P.C.B. W/O COMP. | | | | | FR007930A | | 1 | |
| C 2502 | CHIP TA.CAP. | 0.1uF | 35V | | TESVA1V104M1-8R | K78160025 | | 1- | B |
| C 2503 | CHIP CAP. | 0.1uF | 16V | B | GRM39B104K16PT | K22124805 | | 1- | B |
| C 2504 | CHIP TA.CAP. | 2.2uF | 16V | | TEMSVA1C225M-8R | K78120015 | | 1- | B |
| C 2505 | CHIP TA.CAP. | 0.1uF | 35V | | TESVA1V104M1-8R | K78160025 | | 1- | B |
| C 2506 | CHIP TA.CAP. | 0.1uF | 35V | | TESVA1V104M1-8R | K78160025 | | 1- | B |
| C 2507 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| C 2508 | CHIP TA.CAP. | 1uF | 16V | | TESVA1C105M1-8R | K78120009 | | 1- | B |
| C 2509 | CHIP CAP. | 100pF | 50V | CH | GRM39CH101J50PT | K22174235 | | 1- | B |
| C 2510 | CHIP CAP. | 100pF | 50V | CH | GRM39CH101J50PT | K22174235 | | 1- | B |
| C 2511 | CHIP CAP. | 100pF | 50V | CH | GRM39CH101J50PT | K22174235 | | 1- | B |
| C 2512 | CHIP TA.CAP. | 1uF | 16V | | TESVA1C105M1-8R | K78120009 | | 1- | A |
| C 2513 | CHIP CAP. | 0.01uF | 50V | B | GRM39B103M50PT | K22174823 | | 1- | A |
| C 2514 | CHIP CAP. | 0.01uF | 50V | B | GRM39B103M50PT | K22174823 | | 1- | A |
| C 2515 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 2516 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 2517 | CHIP CAP. | 0.1uF | 16V | B | GRM39B104K16PT | K22124805 | | 1- | A |
| C 2518 | CHIP CAP. | 10pF | 50V | CH | GRM39CH100D50PT | K22174211 | | 1- | A |
| C 2519 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | A |
| C 2520 | CHIP TA.CAP. | 10uF | 6.3V | | TEMSVA0J106M-8R | K78080027 | | 1- | A |
| C 2521 | CHIP CAP. | 4pF | 50V | CH | GRM39CH040C50PT | K22174205 | | 1- | A |
| C 2522 | CHIP CAP. | 0.01uF | 50V | B | GRM39B103M50PT | K22174823 | | 1- | A |
| C 2523 | CHIP CAP. | 0.001uF | 50V | B | GRM39B102K50PT | K22174821 | | 1- | B |
| D 2504 | DIODE | | | | DAN202U T106 | G2070162 | | 1- | A |
| J 2501 | CONNECTOR | | | | 9230B-1-12Z009-T | P0090677 | | 1- | A |
| JP2501 | WIRE ASSY | | | | GRN 120 2/2 | T50512000 | | 1- | |
| JP2501 | WIRE ASSY | | | | GRN 120 (3)/(3) | T51512012 | | 4- | |
| L 2501 | M.RFC | 4.7uH | | | LK1608 4R7K-T | L1690688 | | 1- | A |
| Q 2501 | IC | | | | TC4W66F TE12L | G1091493 | | 1- | B |
| Q 2502 | TRANSISTOR | | | | IMD3 T108 | G3070053 | | 1- | A |
| Q 2503 | TRANSISTOR | | | | DTC114TK T146 | G3070073 | | 1- | A |
| Q 2504 | TRANSISTOR | | | | DTA144EU T106 | G3070079 | | 1- | B |
| Q 2505 | IC | | | | MB1505PF-G-BND-TF | G1091706 | | 1- | A |
| Q 2506 | TRANSISTOR | | | | DTC144EU T106 | G3070041 | | 1- | A |
| Q 2507 | IC | | | | TA75S01F TE85R | G1091593 | | 1- | A |
| R 2501 | CHIP RES. | 22k | 1/16W | 5% | RMC1/16 223JATP | J24185223 | | 1- | B |
| R 2502 | CHIP RES. | 8.2k | 1/16W | 5% | RMC1/16 822JATP | J24185822 | | 1- | A |
| R 2503 | CHIP RES. | 2.2k | 1/16W | 5% | RMC1/16 222JATP | J24185222 | | 1- | B |
| R 2504 | CHIP RES. | 1k | 1/16W | 5% | RMC1/16 102JATP | J24185102 | | 1- | B |
| R 2505 | CHIP RES. | 1k | 1/16W | 5% | RMC1/16 102JATP | J24185102 | | 1- | B |
| R 2506 | CHIP RES. | 1.5k | 1/16W | 5% | RMC1/16 152JATP | J24185152 | | 1- | B |
| R 2508 | CHIP RES. | 10k | 1/16W | 5% | RMC1/16 103JATP | J24185103 | | 1- | B |
| R 2509 | CHIP RES. | 10k | 1/16W | 5% | RMC1/16 103JATP | J24185103 | | 1- | B |
| R 2510 | CHIP RES. | 10k | 1/16W | 5% | RMC1/16 103JATP | J24185103 | | 1- | B |
| R 2511 | CHIP RES. | 33k | 1/16W | 5% | RMC1/16 333JATP | J24185333 | | 1- | A |
| R 2512 | CHIP RES. | 47 | 1/16W | 5% | RMC1/16 470JATP | J24185470 | | 1- | A |
| R 2513 | CHIP RES. | 100k | 1/16W | 5% | RMC1/16 104JATP | J24185104 | | 1- | A |
| R 2514 | CHIP RES. | 100k | 1/16W | 5% | RMC1/16 104JATP | J24185104 | | 1- | A |
| R 2515 | CHIP RES. | 5.6k | 1/16W | 5% | RMC1/16 562JATP | J24185562 | | 1- | A |
| R 2516 | CHIP RES. | 4.7k | 1/16W | 5% | RMC1/16 472JATP | J24185472 | | 1- | A |
| R 2517 | CHIP RES. | 10k | 1/16W | 5% | RMC1/16 103JATP | J24185103 | | 1- | A |
| R 2518 | CHIP RES. | 10k | 1/16W | 5% | RMC1/16 103JATP | J24185103 | | 1- | A |
| R 2520 | CHIP RES. | 22 | 1/16W | 5% | RMC1/16 220JATP | J24185220 | | 1- | A |
| R 2521 | CHIP RES. | 100k | 1/16W | 5% | RMC1/16 104JATP | J24185104 | | 1- | B |
| R 2522 | CHIP RES. | 2.2k | 1/16W | 5% | RMC1/16 222JATP | J24185222 | | 1- | B |
| VR2501 | POT. | 10k | | | EVM-1XSX50B14 | J51800103 | | 1- | A |
| X 2501 | XTAL OSC | 12.8MHz | | | GS43350 12.8MHZ | H9500620 | | 1- | B |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